

EAX-Q77

Intel® Q77 with Core™ i7/ i5/ i3 ATX Motherboard

User's Manual



3rd Ed – 12 March 2014

FCC Statement



THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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1. Getting Started

1.1 Safety Precautions

Warning!



Always disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

Before you begin installing the single board, make sure that the following materials are included in the package:

- 1 x EAX-Q77 ATX Motherboard
- 1 x CD-ROM contains OS drivers/QIG/User's Manual
- 2 x COM cable
- 2 x SATA cable
- 1 x I/O shield



If any of the above items is damaged or missing, contact your retailer.

1.3 Document Amendment History

Revision	Date	Comment
1 st	October 2012	Initial Release
2 nd	December 2013	Update I/O Panel Item
3 rd	March 2014	Update Setting Jumpers & Connectors

This manual describes the Avalue Technology EAX-Q77 Single Board.

We have tried to include as much information as possible but have not duplicated information that is provided in the standard IBM Technical References, unless proven to be necessary to aid in the understanding of this board.

We strongly recommend that you read this manual carefully before attempting to install the EAX-Q77 series or change the standard configurations. Whilst all the necessary information is available in this manual, it is recommend to contact your supplier for guidance for any queries and concern.

Please be aware that it is possible to create configurations within the CMOS RAM that may make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning this manual and want to inform us, please contact our Customer Service department with the relevant details.

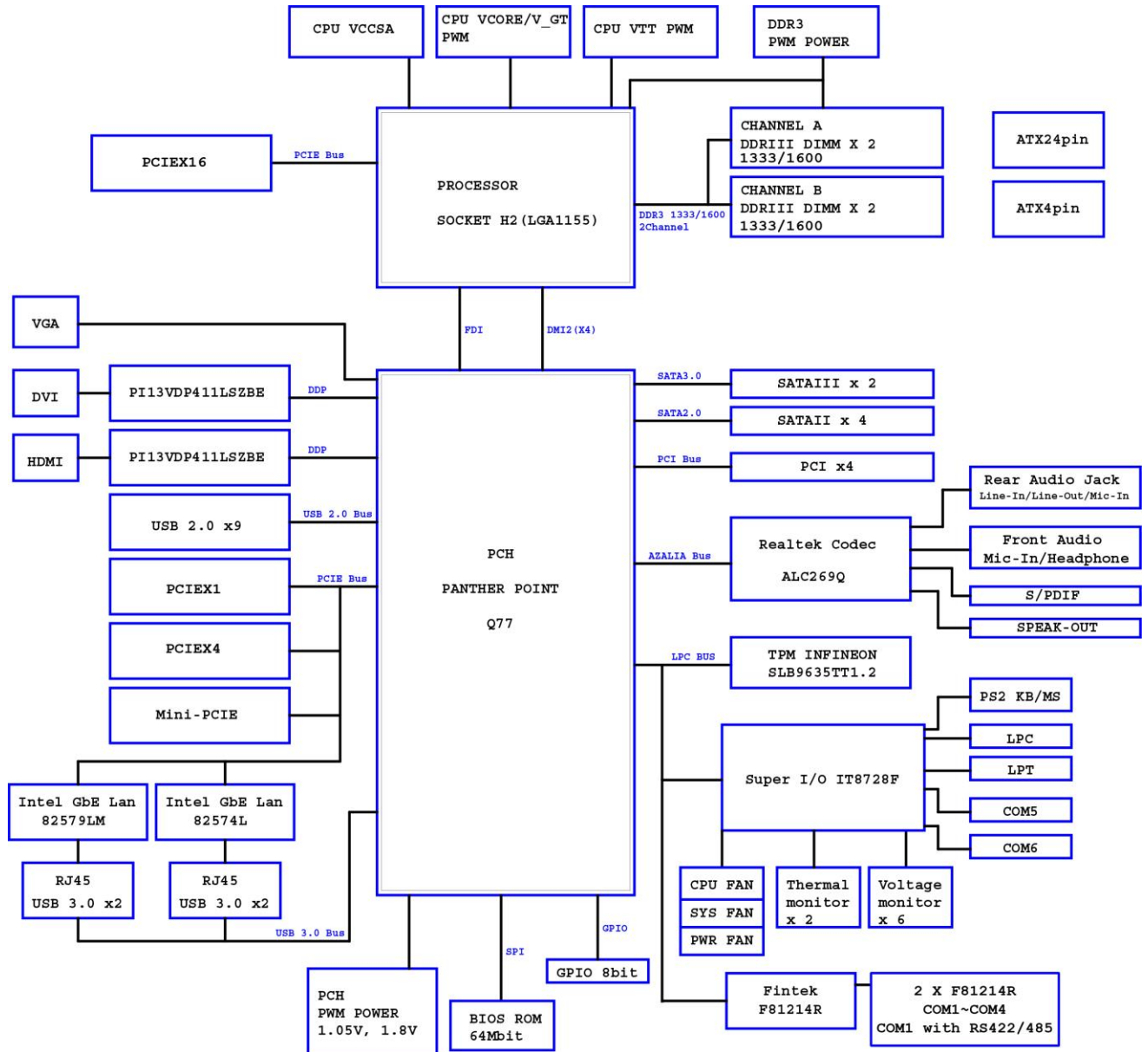
1.4 System Specifications

Items		Specifications
System ▾		
CPU		Intel® LGA1155 socket supports Intel Core i7 / i5 / i3 CPU
BIOS		AMI 64Mb SPI BIOS
System Chipset		Intel® Q77
I/O Chip		ITE8728F + F81214R
System Memory		4 x 240-pin DDR 3 DIMM support 1333/1600MHz, up to 32GB
Watchdog Timer		H/W Reset: 1 to 255 sec/min per step
H/W Status Monitor		Monitoring temperature, voltage, and cooling fan status Auto throttling control when CPU overheats
TPM		Infineon TPM1.2 SLB9635
Expansion		4 x PCI 1 x PCIe x 16 Gen. 3 1 x PCIe x 4 1 x PCIe x 1 1 x mini-PCI-E (does not support USB signal)
Smart Fan Control		Yes
Display ▾		
Chipset		Intel® GMA HD 4000/ 3000 supports DirectX 11, OpenGL 3.1, OpenCL 1.1
Dual Display		HDMI+VGA, HDMI+DVI, VGA+DVI
VGA		Max resolution: 2048 x 1536
HDMI		Max resolution: 1920 x 1200
DVI		Max resolution: 1920 x 1200
Audio ▾		
Chipset		Realtek 269Q, 5.1 Channel HD Audio Build-in 2W amplifier
Audio Interface		Mic-in, Line-in and Line-out, Speaker out
Ethernet ▾		
Chipset		Intel® 82574L GbE controller Intel® 82579 GbE PHY
Ethernet Interface		10/100/1000 Gigabit Ethernet Compatible
I/O ▾		
Back Panel I/O Port ▾		

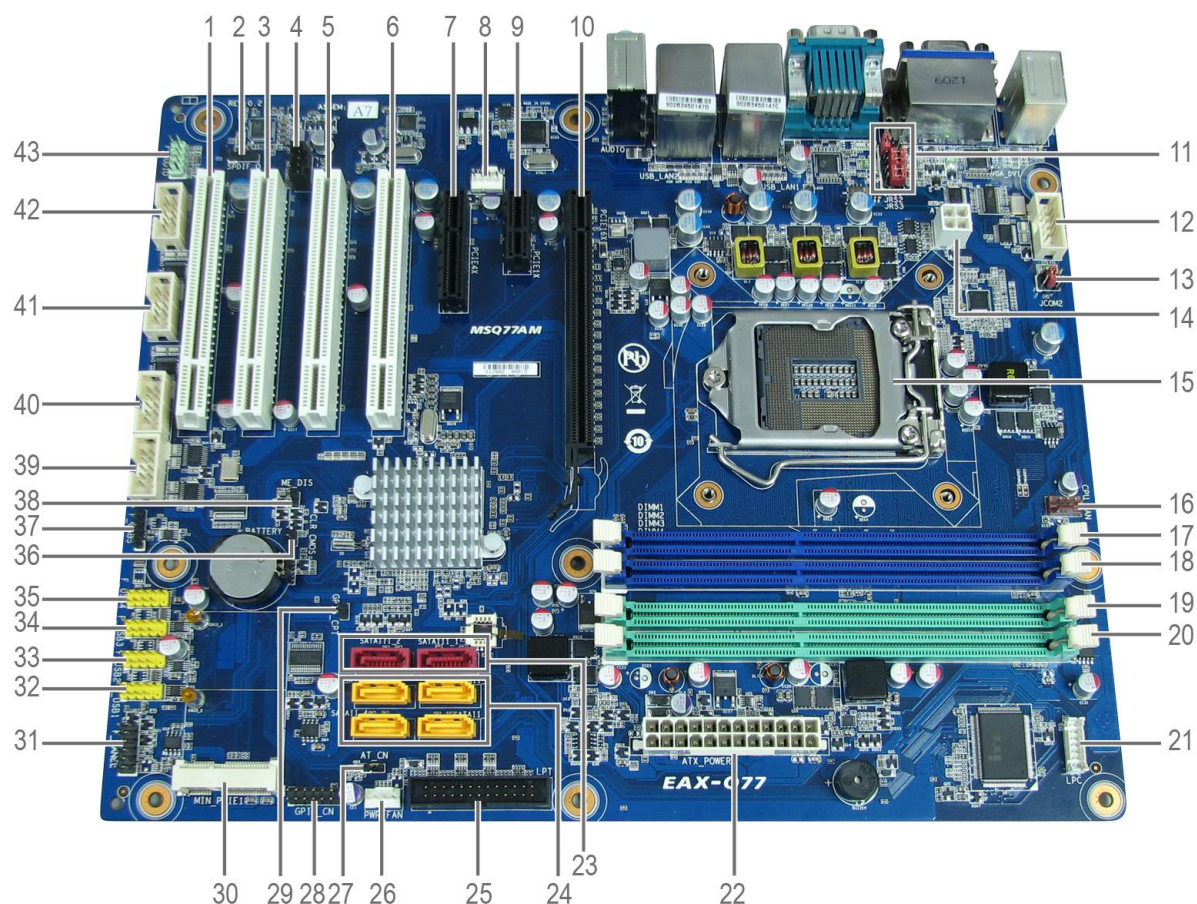
Items Specifications	
Back Panel I/O Port	1 DVI Port 1 VGA Port 1 HDMI Port 1 COM Port (Default is RS-232, RS-422/485 changed by jumper) 4 USB 3.0 Ports 2 LAN RJ45 Ports 1 Audio I/O (3 Jacks) 1 PS/2 Dual deck
Internal I/O Connector	
Internal I/O Connector	4 SATA II Connectors 2 SATA III Connectors 5 COM RS-232 Connectors 1 Front Audio Connector 1 Speaker-out L/R 1 SPDIF Connector 4 USB Connector supports 2 USB Ports (USB2.0) 1 USB Connector supports 1 USB Port (USB2.0) 1 CPU Fan Connector 1 System Fan Connector 1 Power Fan Connector 1 GPIO Connector 1 LPT Connector 1 LPC Connector 1 4-pin ATX Power Connector (DC +12V input) 1 24-pin ATX Power Connector
Power	
Power Management	ATX
Power Type	AT / ATX mode (selectable by Jumper)
ACPI	Single power ATX Support S0, S1, S3, S4, S5 ACPI 3.0 Compliant
Mechanical & Environmental	
Operating Temperature	0~60°C (32~140°F)
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	12" x 9.6" (304.8 mm x 243.84 mm)
Weight	1.32 lbs (0.6 Kg)

1.5 Architecture Overview – Block Diagram

The following block diagram shows the architecture and main components of EAX-Q77.



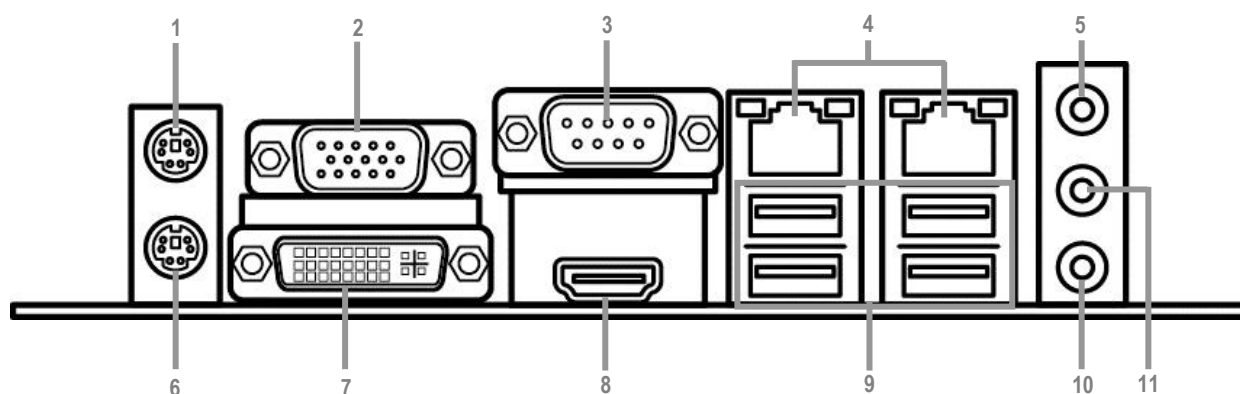
1.6 Motherboard Layout



No	Item
1	PCI Slot (PCI4)
2	SPDIF Header (SPDIF_O)
3	PCI Slot (PCI3)
4	Speaker Out Header (SPK_OUT)
5	PCI Slot (PCI2)
6	PCI Slot (PCI1)
7	PCI Express x4 Slot (PCIE4X)
8	System Fan Header (SYS_FAN)
9	PCI Express x1 Slot (PCIE1X)
10	PCI Express 3.0 x16 Slot (PCIE16X)
11	COM1 RS232/422/485 Jumpers (JRS1/JRS2/JRS3)
12	COM Port Header (COM2)
13	Serial Port +5/+12V Power Select Jumper (JCOM2)

No	Item
14	ATX 12V Power Connector (ATX_12V)
15	CPU Socket
16	CPU Fan Header (CPU_FAN)
17	240-pin DDR3 DIMM Slot (DIMM1)
18	240-pin DDR3 DIMM Slot (DIMM2)
19	240-pin DDR3 DIMM Slot (DIMM3)
20	240-pin DDR3 DIMM Slot (DIMM4)
21	Low Pin Count Header (LPC)
22	24-pin ATX Power Connector (ATX_POWER)
23	Serial ATA 3 Connectors (SATAIII_1~2)
24	Serial ATA 2 Connectors (SATAII_1~4)
25	Printer Port Header (LPT)
26	Power Fan Header (PWR_FAN)
27	Power Mode Select Jumper (AT_CN)
28	General Purpose I/O Connector (GPIO_CN)
29	GPIO 15 pin header (GP15_CPT)
30	Mini PCI Express Slot (MIN_PCIE1)
31	Front Panel Header (F_PANEL)
32	USB 2.0 Header (F_USB1)
33	USB 2.0 Header (F_USB2)
34	USB 2.0 Header (F_USB3)
35	USB 2.0 Header (F_USB4)
36	Clear CMOS Jumper (CLR_CMOS)
37	USB Pin Header (F_USB5)
38	ME Firmware Update Jumper (ME_DIS)
39	COM Port Header (COM3)
40	COM Port Header (COM4)
41	COM Port Header (COM5)
42	COM Port Header (COM6)
43	Front Panel Audio Header (F_AUDIO)

1.7 I/O Panel



No	Item
1	PS/2 Mouse Port (Green)
2	DB-15 VGA Port
3	DB-9 COM Port
4	LAN RJ-45 Ports
5	Line-in Port (Blue)
6	PS/2 Keyboard Port (Purple)
7	DVI-I Port (DVI-I Conn, with digital signal only)
8	HDMI Port
9	USB 3.0 Port
10	Microphone (Pink)
11	Line out Port (Green)

This chapter describes the installation procedures including the safety precautions one must observe before installation.

2. Hardware Installation

2.1 Before Installation

Before installing the motherboard, take note of the following considerations and safety information.

Warning!



Always disconnect the power cord from the chassis before working on the motherboard.

Only experienced electronics personnel should open the PC chassis.

1. Ensure that the motherboard can fit into the chassis.
2. Always unplug the power cord before installing or removing the motherboard or any of its components.
3. Use a grounded wrist strap or touch a grounded object before handling any of the components.
4. When attaching screws to secure the motherboard to the chassis, do not over tighten the screws to avoid damaging the motherboard.

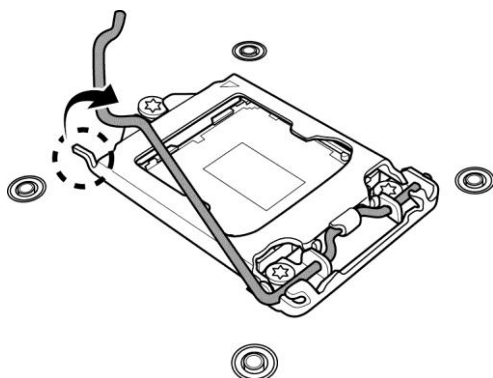
2.2 Installing the CPU

Perform the following steps to install the CPU:

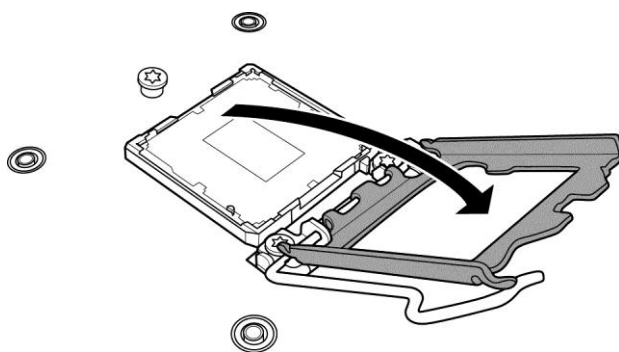


Note: Before installing the CPU, ensure that the surface of the CPU is clean and the pins are not bent.

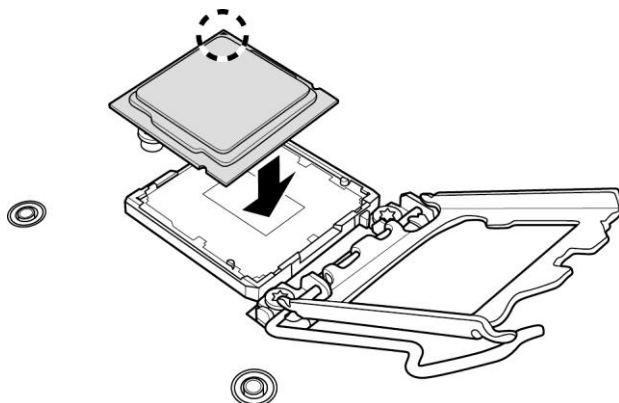
1. Press the lever and slide it out of the hook.



2. Lift to open the socket cover.



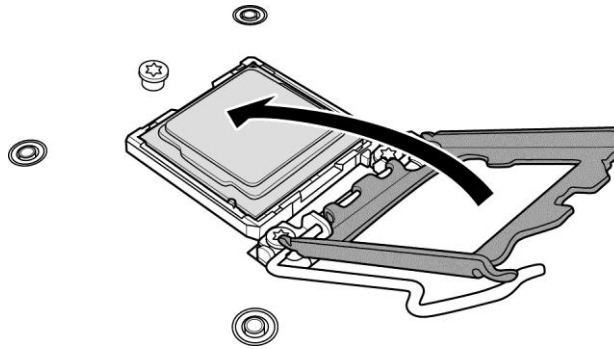
3. Install the CPU making sure the gold triangle is located in the correct direction.



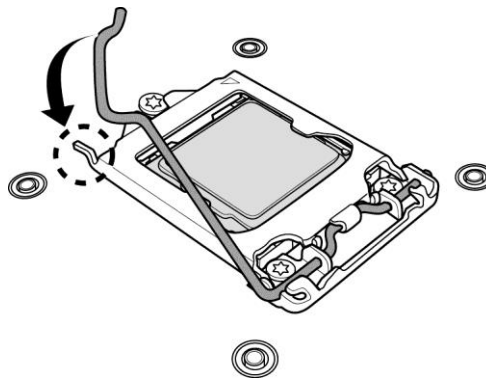
Warning!

Do not force to insert the CPU into the socket. If the CPU does not fit, check for proper orientation. Forcing the CPU into the socket may damage the CPU.

4. Close the socket cover.



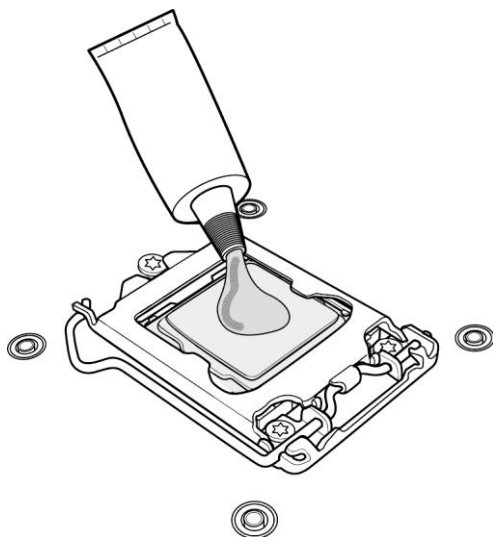
5. Press the lever down and slide it under the hook.



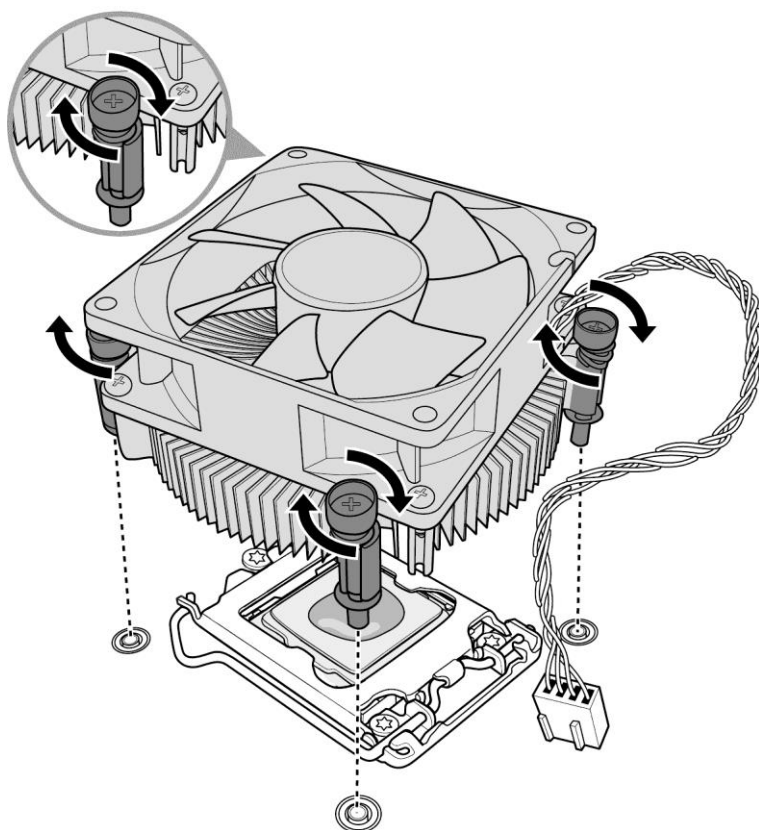
2.3 Installing the CPU Fan and Heat Sink

Perform the following steps to install the CPU fan and heat sink:

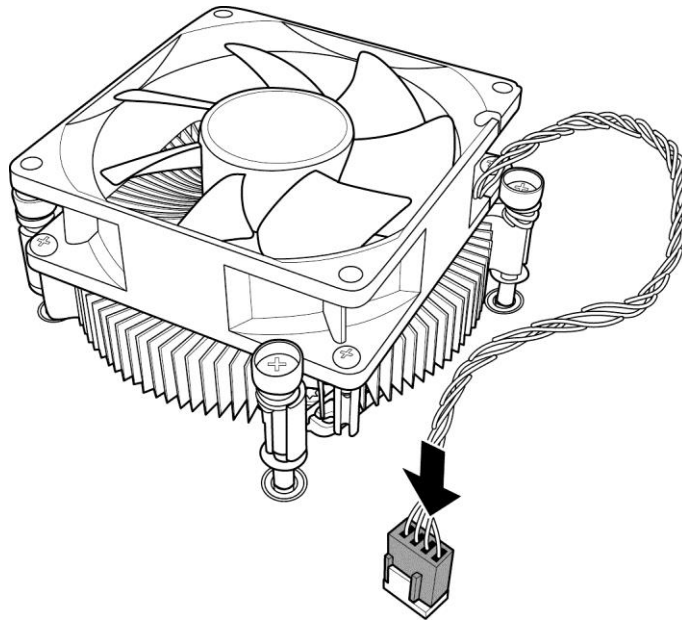
1. Apply the thermal grease onto the center of the CPU socket surface.



2. Align and install the CPU fan and heat sink.
3. Tighten the heat sink screws.



4. Connect the fan header onto the CPU fan connector on the motherboard.



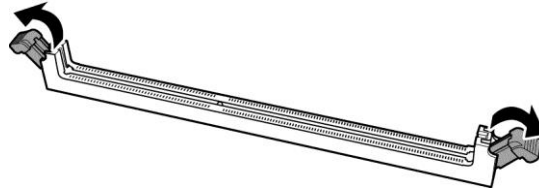
Note: Make sure the heat sink and the CPU top surface are in total contact to avoid CPU overheating problems that may cause the system to hang or be unstable.

2.4 Installing a Memory Module

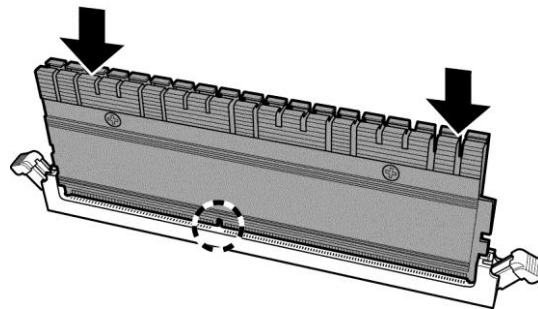
EAX-Q77 provides four (4) 240-pin DDR3 Dual In-Line Memory Module (DIMM) sockets which support data transfer rates of 1333 and 1600 MT/sec. The total maximum memory size is 32 GB.

Perform the following steps to install a memory module to the motherboard:

1. Press the retaining clips outwards.



2. Align a memory module on the slot taking note of the break on the module and the slot.



3. Insert the memory module completely until the retaining clips at both ends lock up and the memory module is seated in place.



Note:

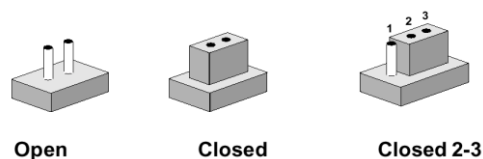
- (1) Do not change any of the DDR3 DIMM parameters in BIOS setup without acquiring technical information in advance.
- (2) Static electricity can damage the electronic components of the computer or the optional boards. Before starting these procedures, ensure that you are discharged of static electricity by touching a grounded metal object briefly.

2.5 Jumper and Connector List

2.5.1 Jumper List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, connect the pins with the clip. To “open” a jumper, remove the clip. Sometimes a jumper has three pins, labeled 1, 2, and 3. In this case, connect either two pins.



The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following table lists the jumpers on your board.

Label	Function
CLR_CMOS	Clear CMOS
JRS1	Serial port1, RS232 / RS422 / RS485 function select
JRS2	Serial port1, RS232 / RS422 / RS485 signal select
JRS3	Serial port1, RS232 / RS422 signal select
JCOM2	Power Select Jumper, +5V / +12V power select
AT_CN	Power Mode Select Jumper, AT / ATX power mode select
ME_DIS	ME Update Firmware Jumper
GP15_CPT	GPIO_CN

2.5.2 Internal Connector List

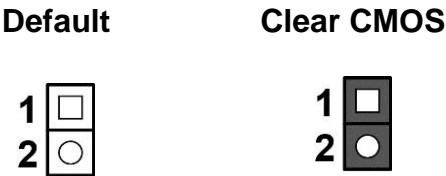
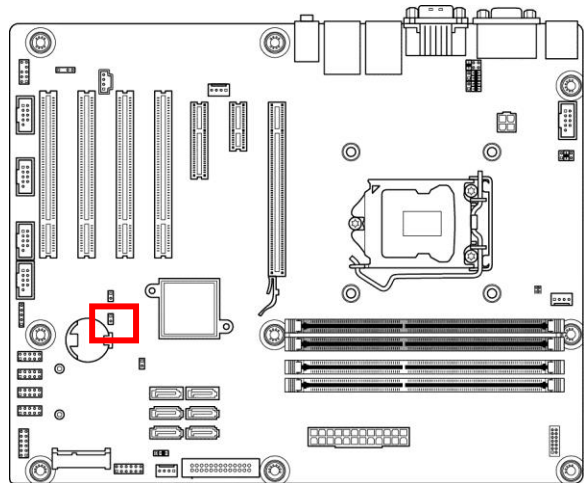
The following table lists the headers on your board.

Label	Function
ATX_POWER	24-pin ATX power connector
ATX_12V	2x2 pin ATX power connector for DC12V
COM2	Serial port connector 2
COM3	Serial port connector 3
COM4	Serial port connector 4
COM5	Serial port connector 5
COM6	Serial port connector 6
CPU_FAN	CPU Fan header
DIMM1	240-pin DDR3 DIMM slot
DIMM2	240-pin DDR3 DIMM slot
DIMM3	240-pin DDR3 DIMM slot
DIMM4	240-pin DDR3 DIMM slot
F_AUDIO	Front panel audio header
F_PANEL	Front panel header
F_USB1	USB 2.0 header
F_USB2	USB 2.0 header
F_USB3	USB 2.0 header
F_USB4	USB 2.0 header
F_USB5	USB pin header
GP15_CPT	GPIO15 pin header
GPIO_CN	General Purpose I/O connector
LPC	Low pin count header
LPT	Printer port header
MIN_PCIE1	Mini PCI Express slot
PCIEX16	PCI Express 3.0 x16 slot
PCIEX1	PCI Express x1 slot
PCIEX4	PCI Express x4 slot
PCI1	PCI slot
PCI2	PCI slot
PCI3	PCI slot
PCI4	PCI slot
PWR_FAN	Power fan header
SATAIII_1	Serial ATA 3 connector
SATAIII_2	Serial ATA 3 connector
SATAII_1	Serial ATA 2 connector

Label	Function
SATAII_2	Serial ATA 2 connector
SATAII_3	Serial ATA 2 connector
SATAII_4	Serial ATA 2 connector
SPDIF_O	SPDIF header
SPK_OUT	Speaker out header
SYS_FAN	System fan header

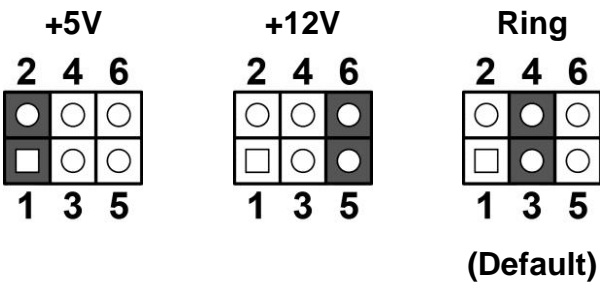
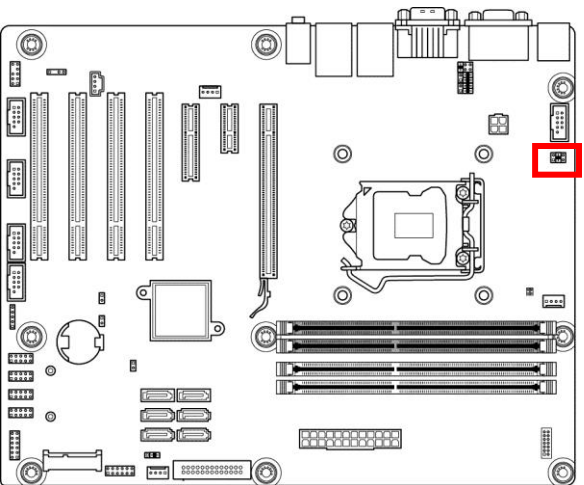
2.6 Setting Jumpers & Connectors

2.6.1 Clear CMOS Jumper (CLR_CMOS)



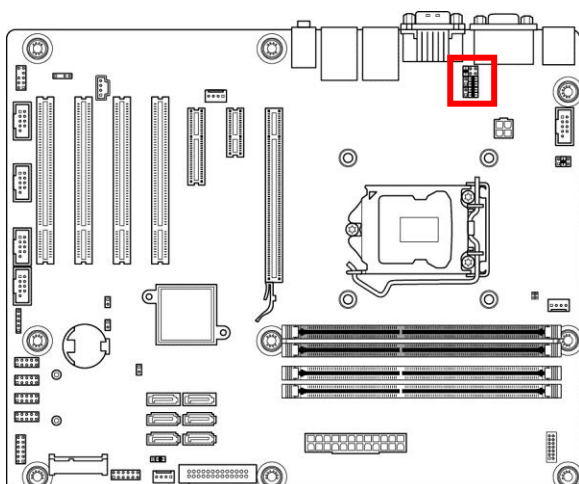
PINS	Signal
1	GND
2	-RTCRST

2.6.2 Serial Port 2 5V / 12V Power Select Jumper (JCOM2)



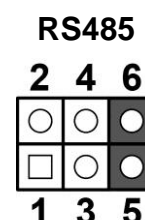
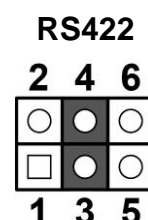
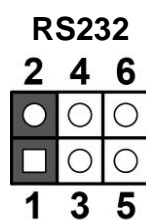
Signal	PINS		Signal
VCC	1	2	RI2-/5V/12V
NRI2-	3	4	RI2-/5V/12V
+12V	5	6	RI2-/5V/12V

2.6.3 Serial Port 1 Signal Select Jumpers (JRS1/JRS2/JRS3)



JRS1

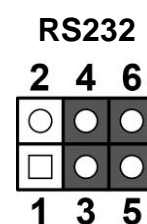
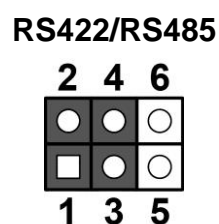
Signal	PINS		Signal
RXD232	1	2	RD1
RXD 422	3	4	RD1
RXD 485	5	6	RD1



(Default)

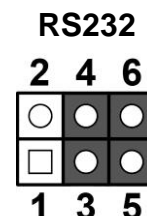
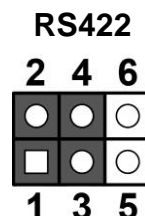
JRS2

Signal	PINS		Signal
RS485_B	1	2	RS485_A
ND CD1_D-	3	4	NRXD1_D-
ND CD1-	5	6	NRXD1-



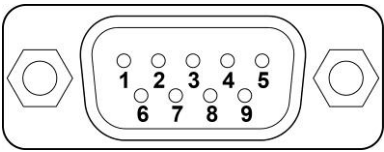
JRS3

Signal	PINS		Signal
RS422_B	1	4	NTXD1_D-
RS422_A	2	5	NDTR1-
NDTR1_D-	3	6	NTXD1-



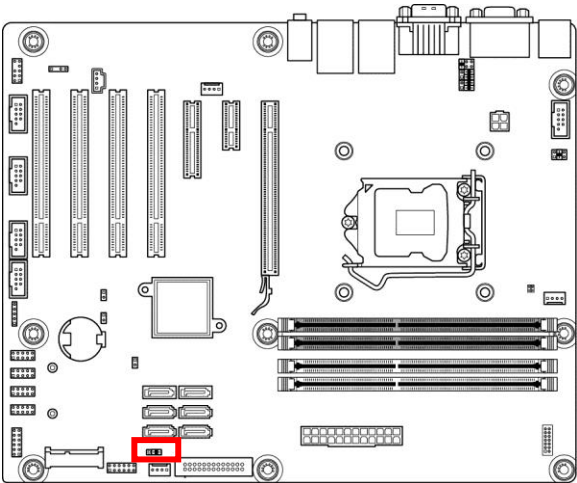
EAX-Q77 User’s Manual

RS422/485 Pin Mapping

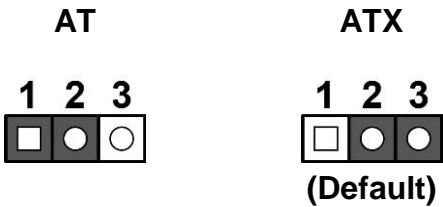


PIN	RS-232	RS-485	RS-422
1	DCD	TXD-	TXD-
2	RXD	TXD+	TXD+
3	TXD		RXD+
4	DTR		RXD-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

2.6.4 Power Mode Select Jumper (AT_CN)

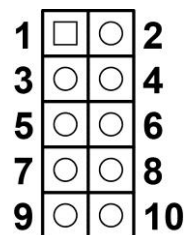
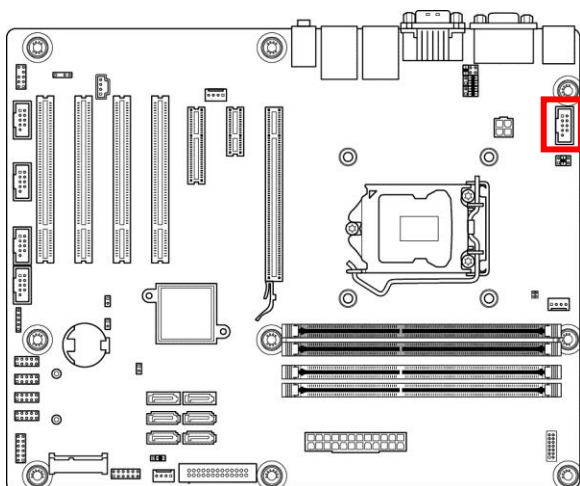


PIN	Signal
1	AT_PWR_F_BTN#
2	-PWRBT_F
3	NC



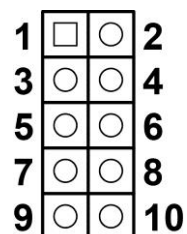
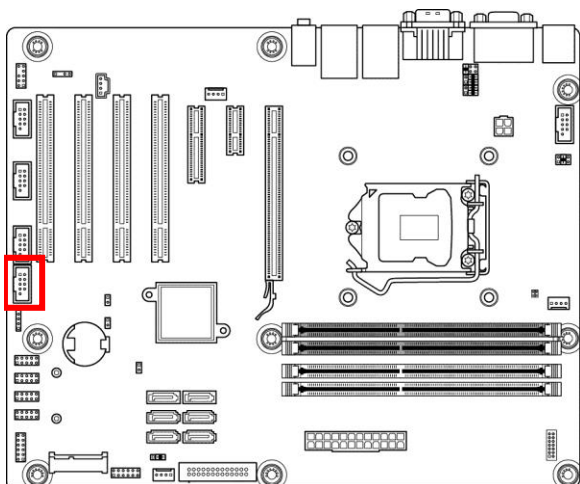
2.6.5 COM Port Headers (COM2/COM3/COM4/COM5/COM6)

COM2



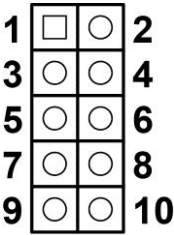
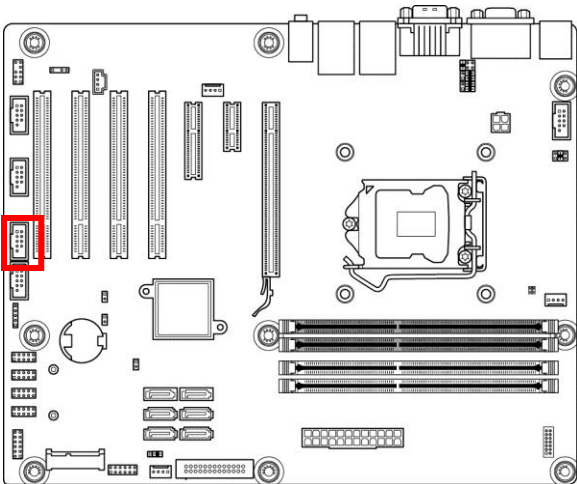
Signal	PIN	PIN	Signal
NDCD2-	1	2	NRXD2-
NTXD2-	3	4	NDTR2-
GND	5	6	NDSR2-
NRTS2-	7	8	NCTS2-
RI2-/5V/12V	9	10	NC

COM3



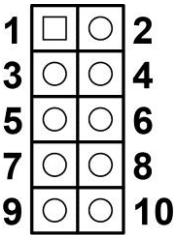
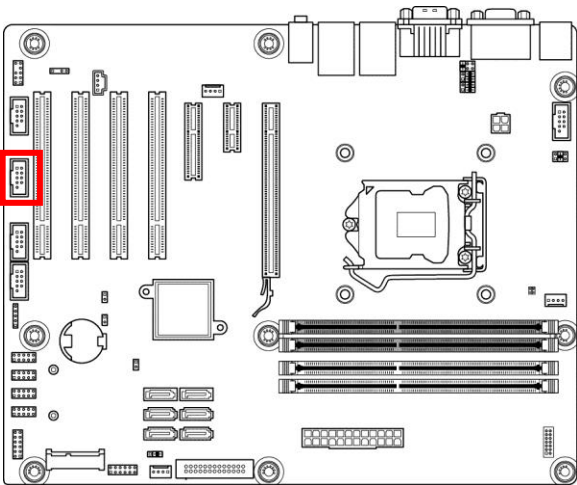
Signal	PIN	PIN	Signal
NDCD3-	1	2	NRXD3-
NTXD3-	3	4	NDTR3-
GND	5	6	NDSR3-
NRTS3-	7	8	NCTS3-
NRI3-	9	10	NC

COM4

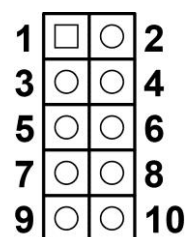
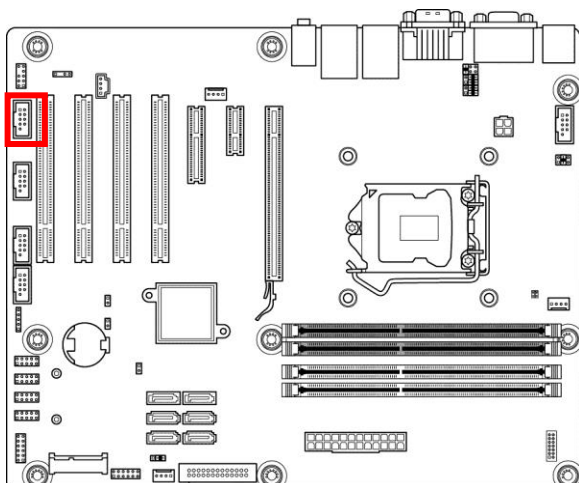


Signal	PIN	PIN	Signal
NDCD4-	1	2	NRXD4-
NTXD4-	3	4	NDTR4-
GND	5	6	NDSR4-
NRTS4-	7	8	NCTS4-
NRI4-	9	10	NC

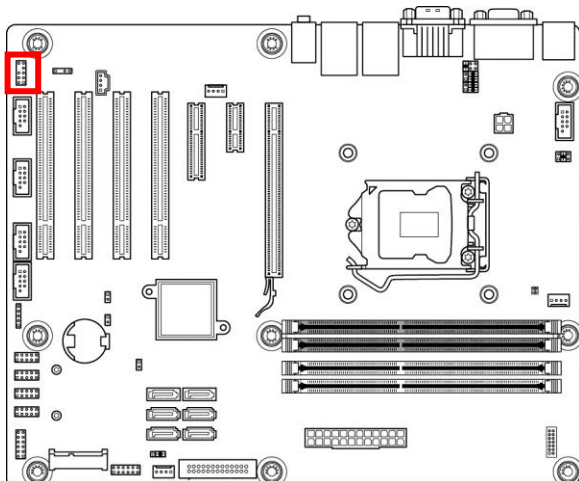
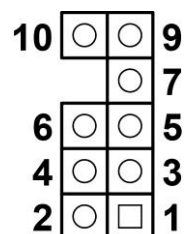
COM5



Signal	PIN	PIN	Signal
NDCD5-	1	2	NRXD5-
NTXD5-	3	4	NDTR5-
GND	5	6	NDSR5-
NRTS5-	7	8	NCTS5-
NRI5-	9	10	NC

COM6

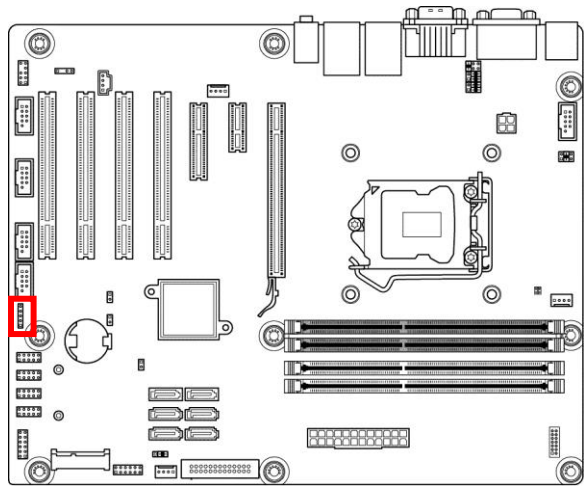
Signal	PIN	PIN	Signal
NDCD6-	1	2	NRXD6-
NTXD6-	3	4	NDTR6-
GND	5	6	NDSR6-
NRTS6-	7	8	NCTS6-
NRI6-	9	10	NC

2.6.6 Front Panel Audio Header (F_AUDIO)**F_AUDIO**

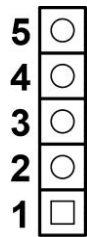
Signal	PIN	PIN	Signal
MIC_L	1	2	AGND
MIC_R	3	4	-ACZ_DET
HPOUT_R	5	6	SRTN1
FAUDIO_JD	7		
HPOUT_L	9	10	SRTN2

Signal	Signal Description
MIC_L	Front panel microphone left channel
MIC_R	Front panel microphone right channel
-ACZ_DET	Active low when an Intel® HD Audio dongle is connected
HPOUT_R_H	Front panel headphone right channel
HPOUT_L_H	Front panel headphone left channel
SRTN1	Jack detection for front panel microphone
SRTN2	Jack detection for front panel headphone
FAUDIO_JD	Front panel jack detect

2.6.7 USB Pin Header (F_USB5)

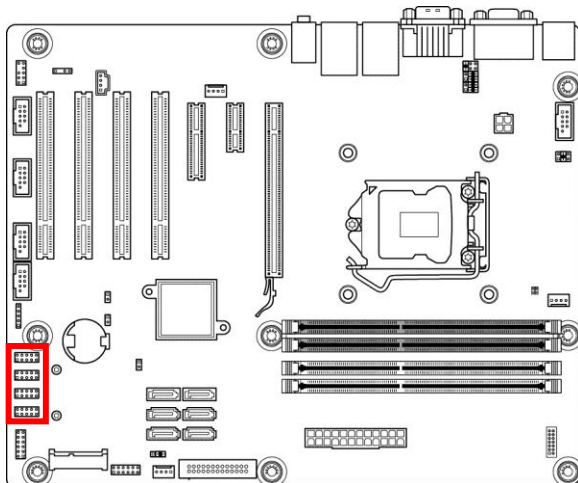


F_USB5

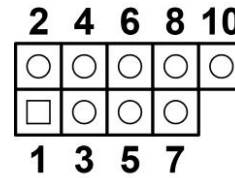


PIN	Signal
5	USB Power
4	-FUSBP12
3	+FUSBP12
2	GND
1	GND

2.6.8 USB 3.0 Header (F_USB1 / F_USB2 / F_USB3 / F_USB3 / F_USB4)



F_USB1 / F_USB2 / F_USB3 / F_USB4



F_USB1

Signal	PIN	PIN	Signal
USB Power	1	2	USB Power
-FUSBP5	3	4	-FUSBP4
+FUSBP5	5	6	+FUSBP4
GND	7	8	GND
		10	GND

F_USB2

Signal	PIN	PIN	Signal
USB Power	1	2	USB Power
-FUSBP7	3	4	-FUSBP6
+FUSBP7	5	6	+FUSBP6
GND	7	8	GND
		10	GND

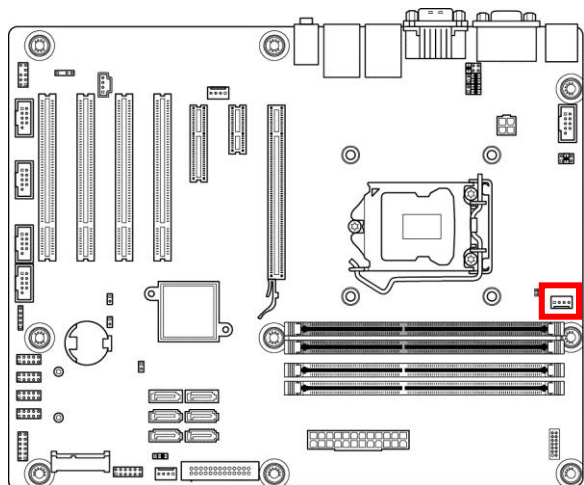
F_USB3

Signal	PIN	PIN	Signal
USB Power	1	2	USB Power
-FUSBP9	3	4	-FUSBP8
+FUSBP9	5	6	+FUSBP8
GND	7	8	GND
		10	GND

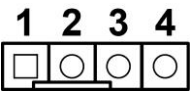
F_USB4

Signal	PIN	PIN	Signal
USB Power	1	2	USB Power
-FUSBP11	3	4	-FUSBP10
+FUSBP11	5	6	+FUSBP10
GND	7	8	GND
		10	GND

2.6.9 CPU Fan Header (CPU_FAN)

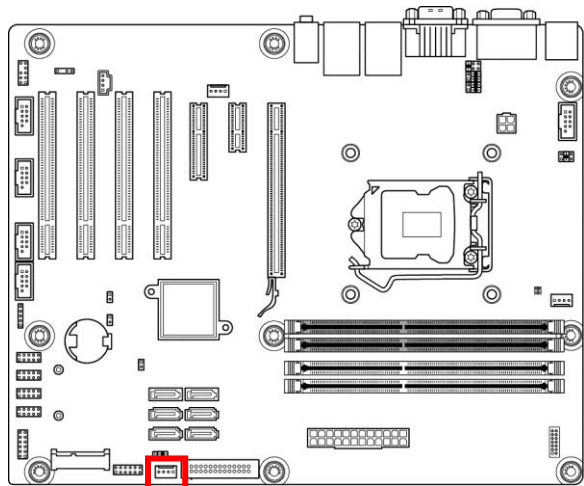


CPU_FAN

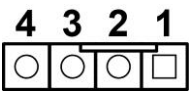


PIN	Signal
1	GND
2	+12V
3	TACH_CPUFAN
4	PWM_CPUFAN

2.6.10 Power Fan Header (PWR_FAN)

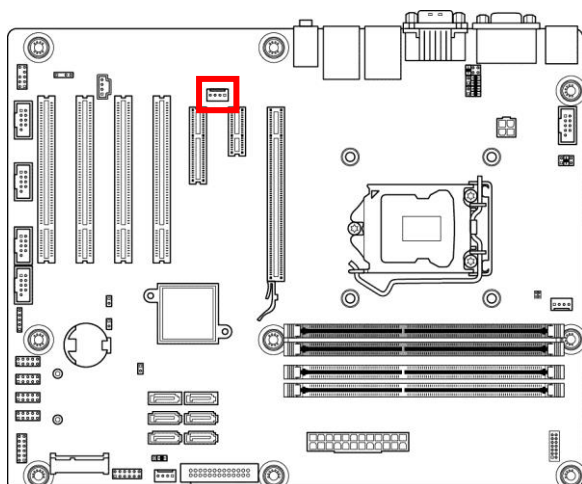


PWR_FAN

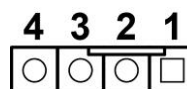


PIN	Signal
1	GND
2	+12V
3	TACH_PWRFAN
4	PWM_PWMFAN

2.6.11 System Fan Header (SYS_FAN)

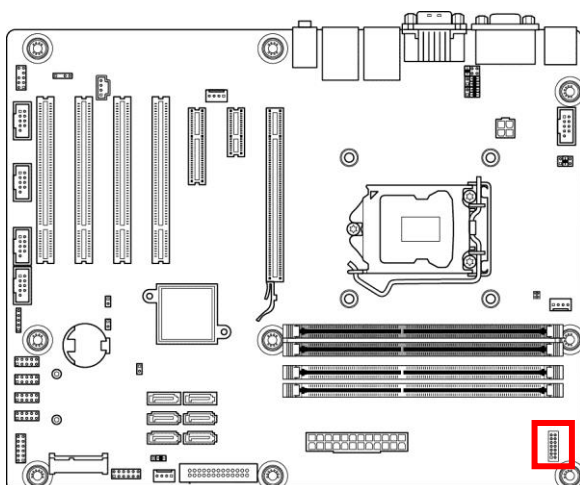


SYS_FAN

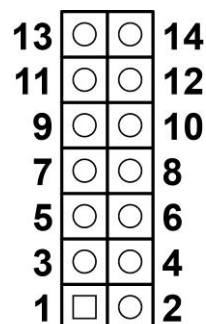


PIN	Signal
1	GND
2	+12V
3	TACH_SYSFAN
4	PWM_SYSFAN

2.6.12 Low Pin Count Header (LPC)

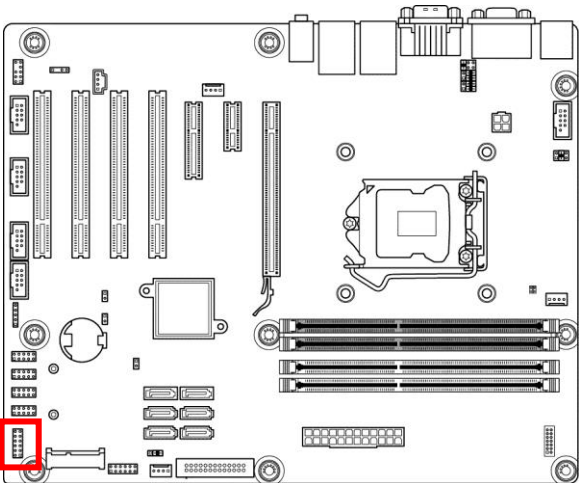


LPC

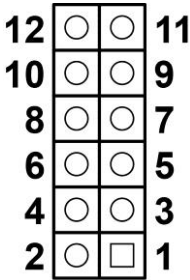


Signal	PIN	PIN	Signal
LAD0	1	2	VCC3
LAD1	3	4	-PFMRST
LAD2	5	6	-LFRAME
LAD3	7	8	LPCCLK33_LPC
SERIRQ	9	10	GND
VCC	11	12	GND
5VDUAL	13	14	GND

2.6.13 Front Panel Header (F_PANEL)

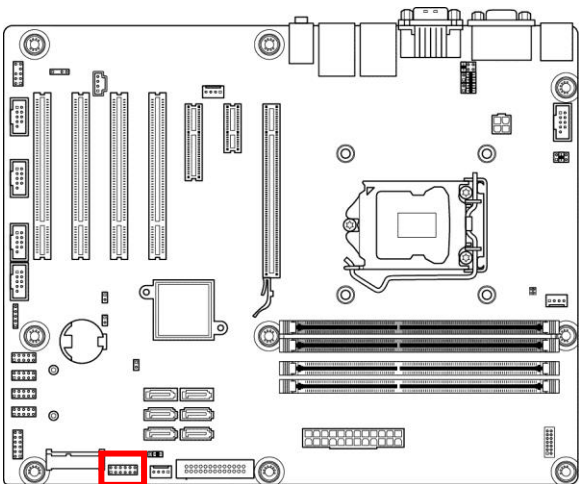


F_PANEL

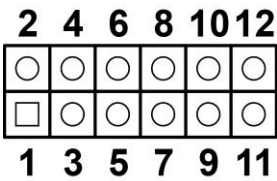


Signal	PIN	PIN	Signal
-PWRBT_F	1	2	GND
-SYS_RST	3	4	GND
MPD+	5	6	GND
SATALED-	7	8	HD+
-INTRUDER	9	10	GND
STB_LED+	11	12	STB_LED-

2.6.14 General Purpose I/O Connector (GPIO_CN)

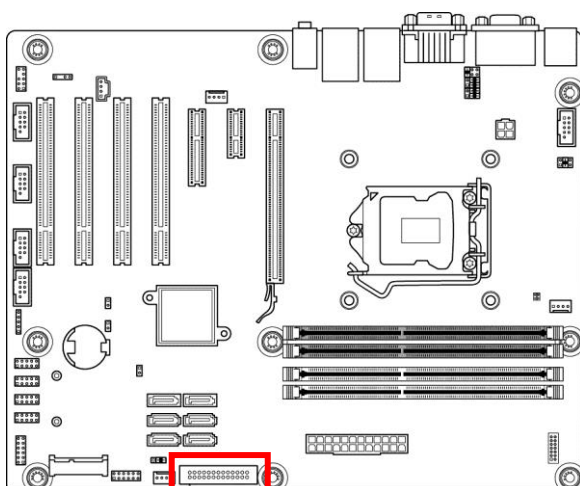


GPIO_CN



Signal	PIN	PIN	Signal
PCH_GPIO1	1	2	PCH_GPIO49
PCH_GPIO6	3	4	PCH_GPIO19
PCH_GPIO7	5	6	PCH_GPIO21
PCH_GPIO17	7	8	PCH_GPIO22
SMBCLK	9	10	SMBDATA
VCC	11	12	GND

2.6.15 Printer Port Header (LPT)

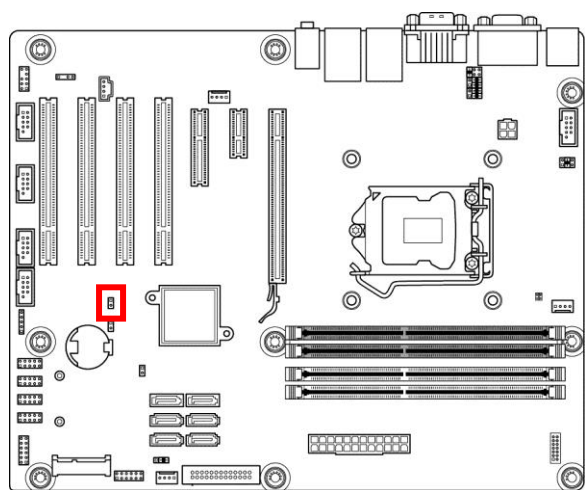


LPT

2	4	6	8	10	12	14	16	18	20	22	24	26
○	○	○	○	○	○	○	○	○	○	○	○	○
□	○	○	○	○	○	○	○	○	○	○	○	○
1	3	5	7	9	11	13	15	17	19	21	23	25

Signal	PIN	PIN	Signal
LPT1	1	2	LPT14
LPT2	3	4	ERR-
LPT3	5	6	LPT16
LPT4	7	8	LPT17
LPT5	9	10	GND
LPT6	11	12	GND
LPT7	13	14	GND
LPT8	15	16	GND
LPT9	17	18	GND
ACK-	19	20	GND
BUSY	21	22	GND
PE	23	24	GND
SLCT	25	26	GND

2.6.16 ME Firmware Update Jumper (ME_DIS)

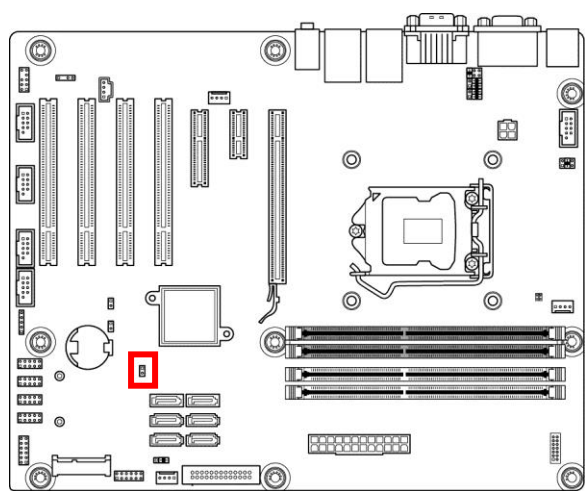


ME_DIS



PIN	Signal
1	VCC3_DSW
2	HAD_SDOUT

2.6.17 GPIO 15 Pin Header (GP15_CPT)

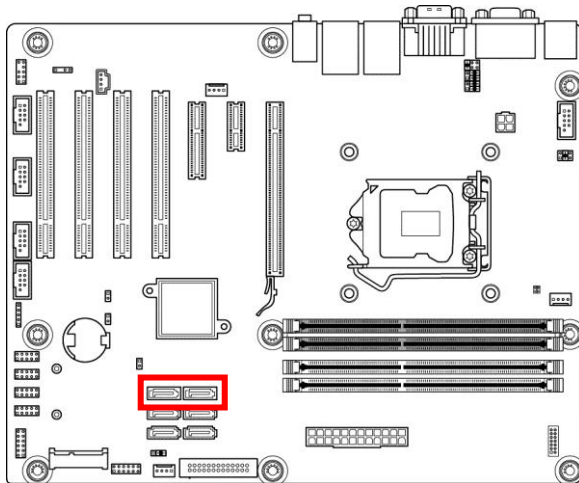


GP15_CPT

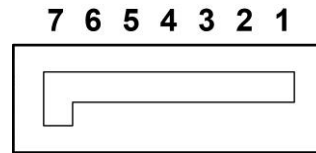


PIN	Signal
1	GPIO15
2	GND

2.6.18 SATA 3 Connectors (SATAIII_1 / SATAIII_2)



SATAIII_1 / SATAIII_2



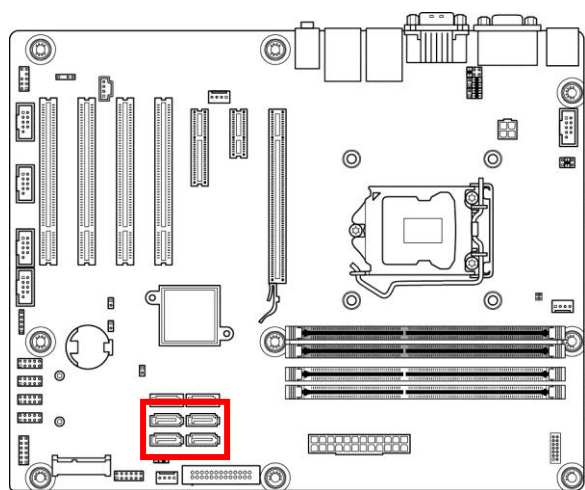
SATAIII_1

PIN	Signal
7	GND
6	SATAIIIRX0P
5	SATAIIIRX0N
4	GND
3	SATAIIITX0N
2	SATAIIITX0P
1	GND

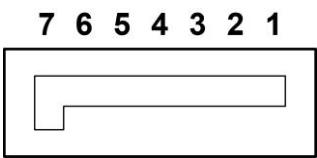
SATAIII_2

PIN	Signal
7	GND
6	SATAIIIRX1P
5	SATAIIIRX1N
4	GND
3	SATAIIITX1N
2	SATAIIITX1P
1	GND

2.6.19 SATA 2 Connectors (SATAII_1 / SATAII_2 / SATAII_3 / SATAII_4)



SATAII_1 / SATAII_2 /
SATAII_3 / SATAII_4



SATAII_1

PIN	Signal
7	GND
6	SATAIIRX0P
5	SATAIIRX0N
4	GND
3	SATAIITX0N
2	SATAIITX0P
1	GND

SATAII_2

PIN	Signal
7	GND
6	SATAIIRX1P
5	SATAIIRX1N
4	GND
3	SATAIITX1N
2	SATAIITX1P
1	GND

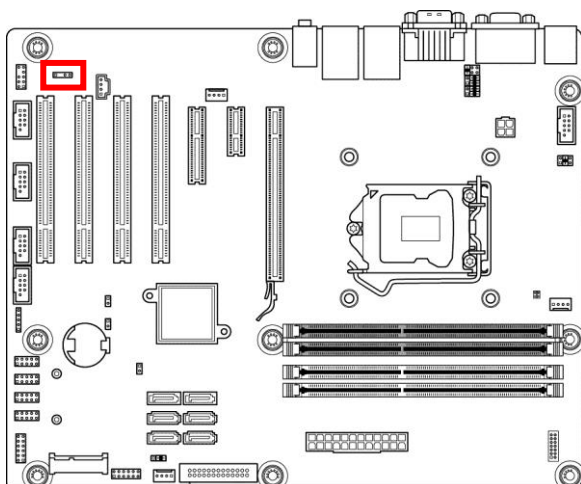
SATAII_3

PIN	Signal
7	GND
6	SATAIIRX2P
5	SATAIIRX2N
4	GND
3	SATAIITX2N
2	SATAIITX2P
1	GND

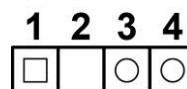
SATAII_4

PIN	Signal
7	GND
6	SATAIIRX3P
5	SATAIIRX3N
4	GND
3	SATAIITX3N
2	SATAIITX3P
1	GND

2.6.20 SPDIF Header (SPDIF_O)

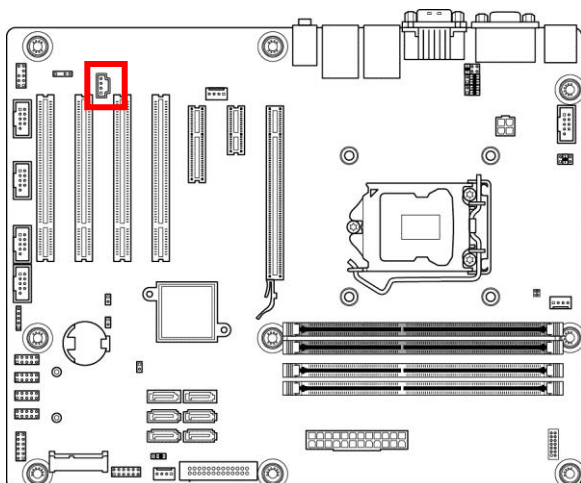


SPDIF_O



PIN	Signal
1	VCC
2	
3	SPDIF
4	GND

2.6.21 Speaker Out Header (SPK_OUT)



SPK_OUT



PIN	Signal
1	OUT_R+
2	OUT_R-
3	OUT_L-
4	OUT_L+

3. BIOS Setup

3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

3.2 Starting Setup

The BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins checking the system and configuring it. When it finishes, the BIOS seeks an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of the two ways:

By pressing immediately after switching the system on, or

By pressing the key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

In general, use the arrow keys to highlight items, press <Enter> to select, press <F1> for help and press <Esc> to quit.

The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help
F2 key	Previous values
F3 key	Optimized defaults
F4 key	Save and exit setup

- **Navigating Through The Menu Bar**

Use the left and right arrow keys to choose the menu you want to be in.



Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A “➤” pointer marks all sub menus.

- **To Display Help**

Press F1 to display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the <F1> key again.

3.4 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the BIOS supports an override to the NVRAM settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.5 BIOS setup

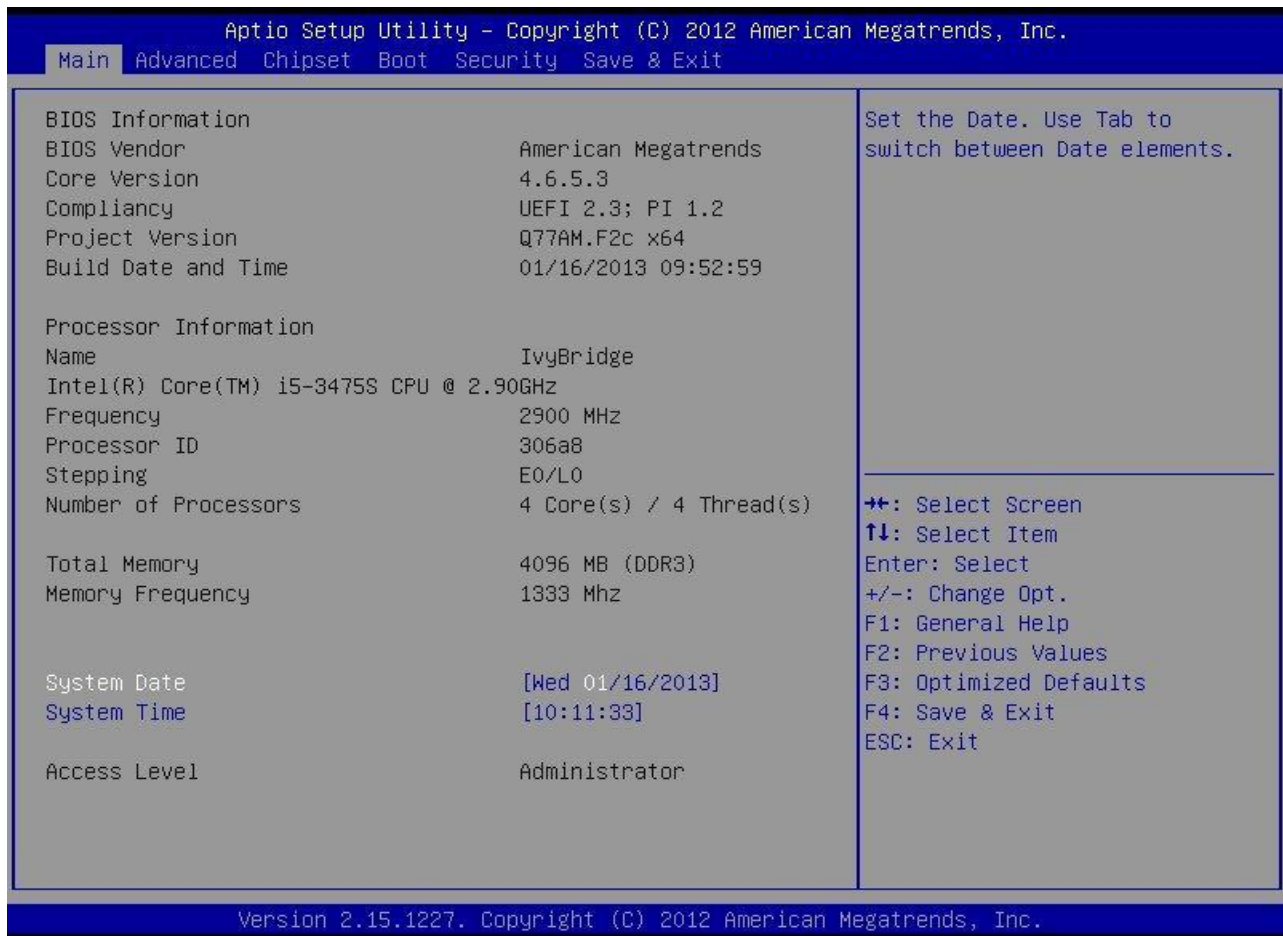
Once you enter the BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.



Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen. Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.5.1 Main Menu and System information

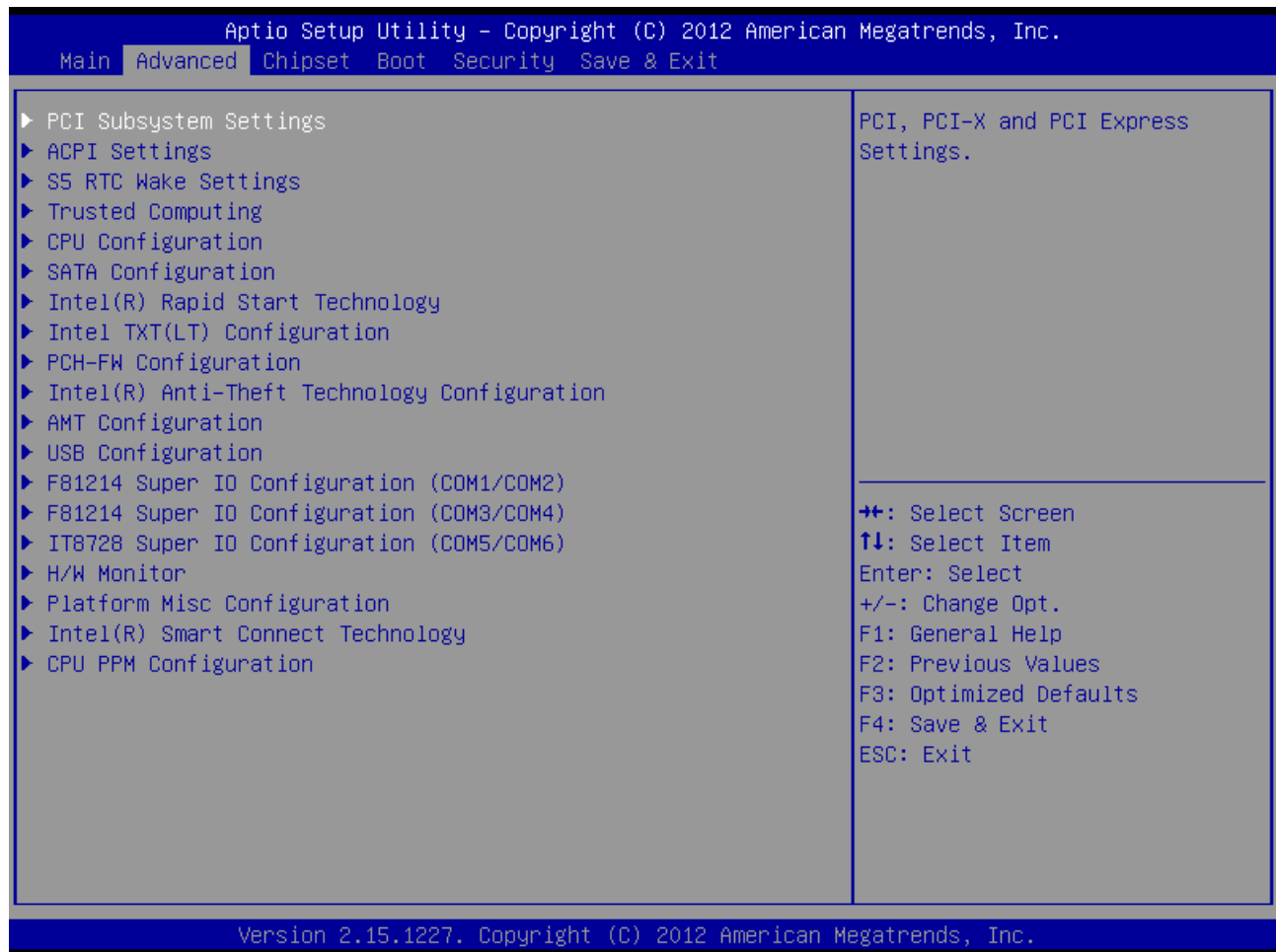
This section allows you to record some basic hardware configurations in your computer and set the system clock.



Item	Description
System Date	Use the system Date option to set the system date. Manually enter the day, month and year.
System Time	Use the system time option to set the system time. Manually enter the hours, minutes and seconds

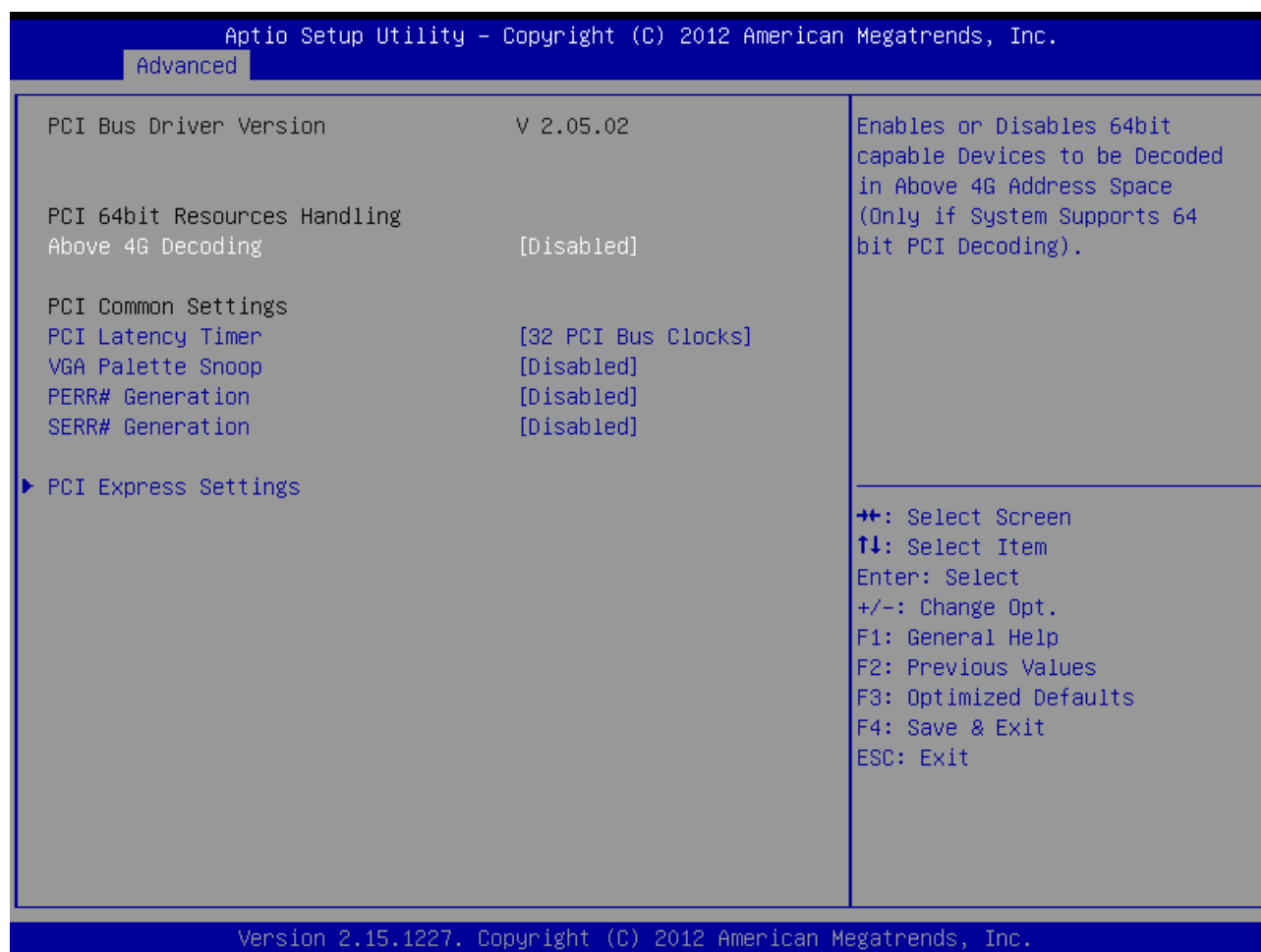
3.5.2 Advanced Settings

This section allows you to configure the CPU and other system devices for basic operation through its sub-menus.



3.5.2.1 PCI Subsystem Settings

Use the PCI Subsystem Settings menu to displays the PCI Bus driver version and common settings, and configures PCI, PCI-X and PCI Express settings.



Item	Description
Above 4G Decoding	Enables or disables 64-bit capable devices to be decoded in the above 4G address space. Note: Only if the system supports 64-bit PCI decoding.
PCI Latency Timer	Controls how long the PCI device can hold the bus before another takes over. It is recommended to set this to a mid-range value.
VGA Palette Snoop	Enables or disables VGA palette snooping.
PERR# Generation	Enables or disables PCI devices to generate PERR#
SERR# Generation	Enables or disables PCI devices to generate SERR#
PCI Express Settings	See "PCI Express Settings" on the next page.

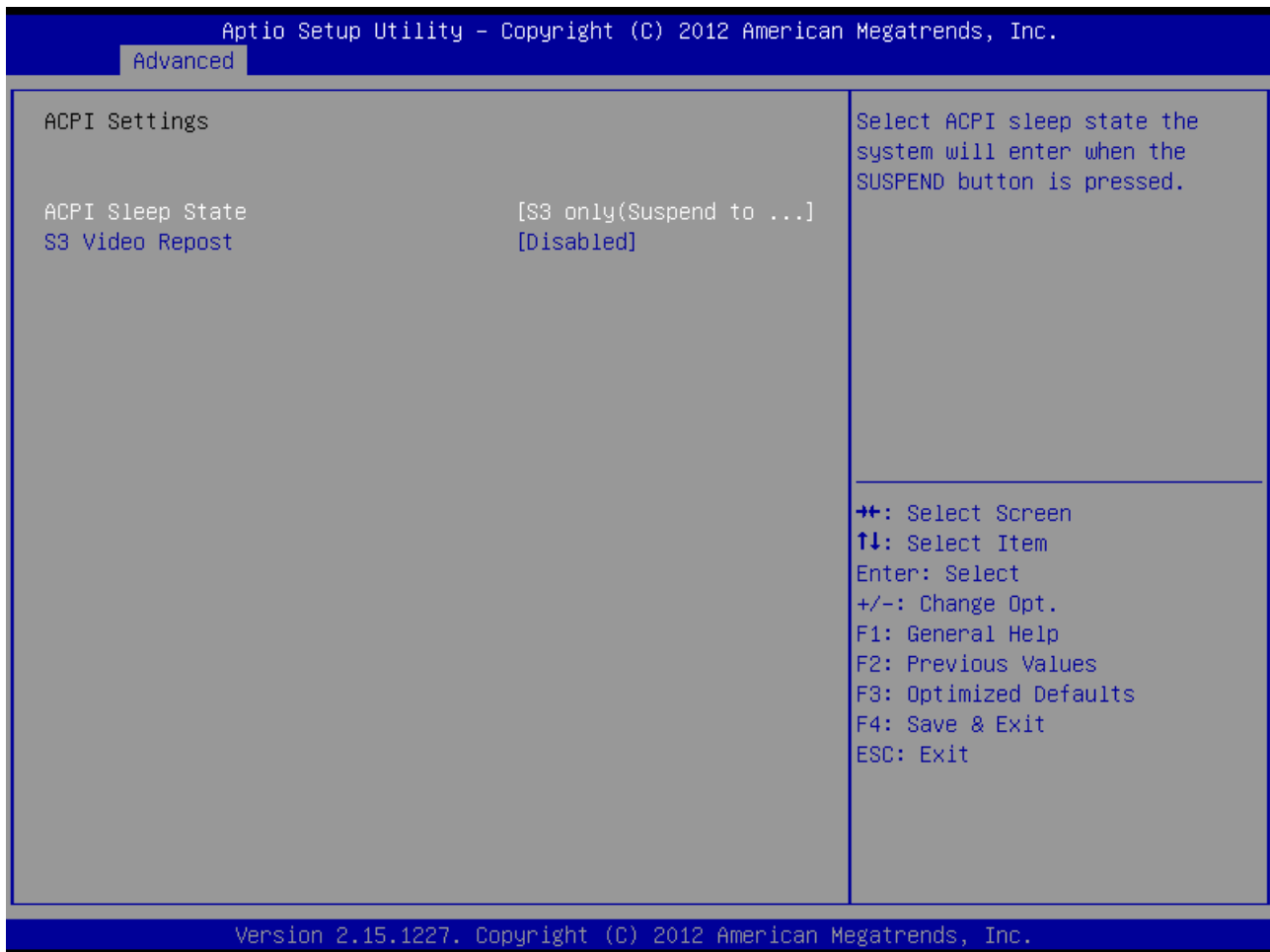
PCI Express Settings

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
PCI Express Device Register Settings		Enables or Disables PCI Express Device Relaxed Ordering.
Relaxed Ordering	[Disabled]	
Extended Tag	[Disabled]	
No Snoop	[Enabled]	
Maximum Payload	[Auto]	
Maximum Read Request	[Auto]	
PCI Express Link Register Settings		
ASPM Support	[Disabled]	
WARNING: Enabling ASPM may cause some PCI-E devices to fail		
Extended Synch	[Disabled]	
Link Training Retry	[5]	++ : Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC : Exit
Link Training Timeout (uS)	100	
Unpopulated Links	[Keep Link ON]	
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Item	Description
Relaxed Ordering	Enables or disables PCI Express Device relaxed ordering.
Extended Tag	Enables or disables extended tag which uses an 8-bit tag field as a requester.
No Snoop	Enables or disables PCI Express Device No Snoop option.
Maximum Payload	Sets the maximum payload of PCI Express Devices.
Maximum Read Request	Enables or disables the boot option for legacy network devices.
ASPM Support	Enables or disables SPM support. Enabling ASPM may cause some PCI-E devices to fail.
Extended Synch	Enables or disables generation of Extended Synchronization patterns.
Link Training Retry	Sets the link training retry.
Link Training Timeout	Sets the link training timeout.
Unpopulated Links	Sets the unpopulated links.

3.5.2.2 ACPI Settings

Use the ACPI Settings menu to configure the ACPI sleep state when the system is suspended.

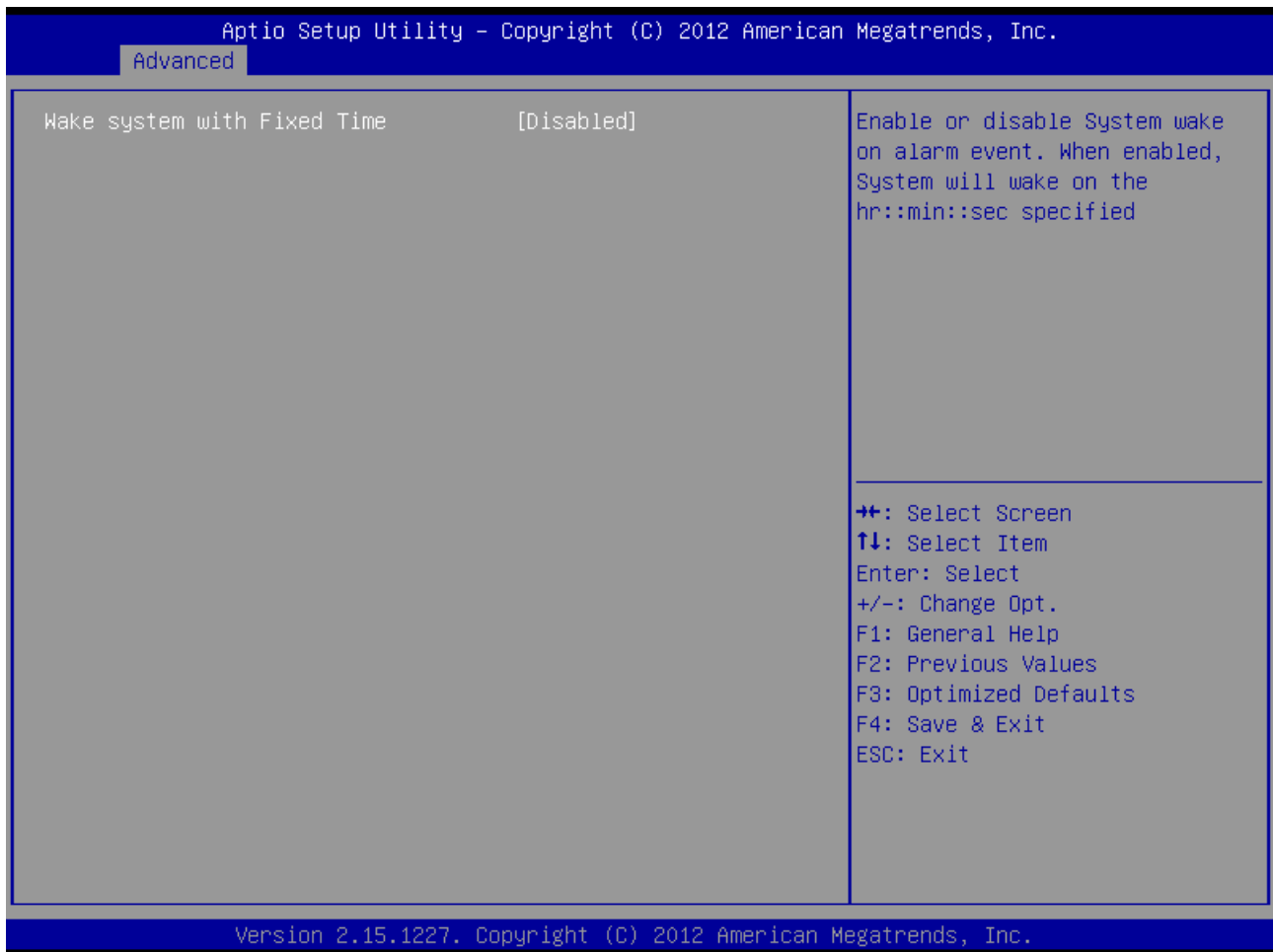


Item	Description
ACPI Sleep State	Sets the sleep state that the system enters when it is suspended.
S3 Video Repost	Enables or disables users to invoke VA BIOS POST during S3 mode.

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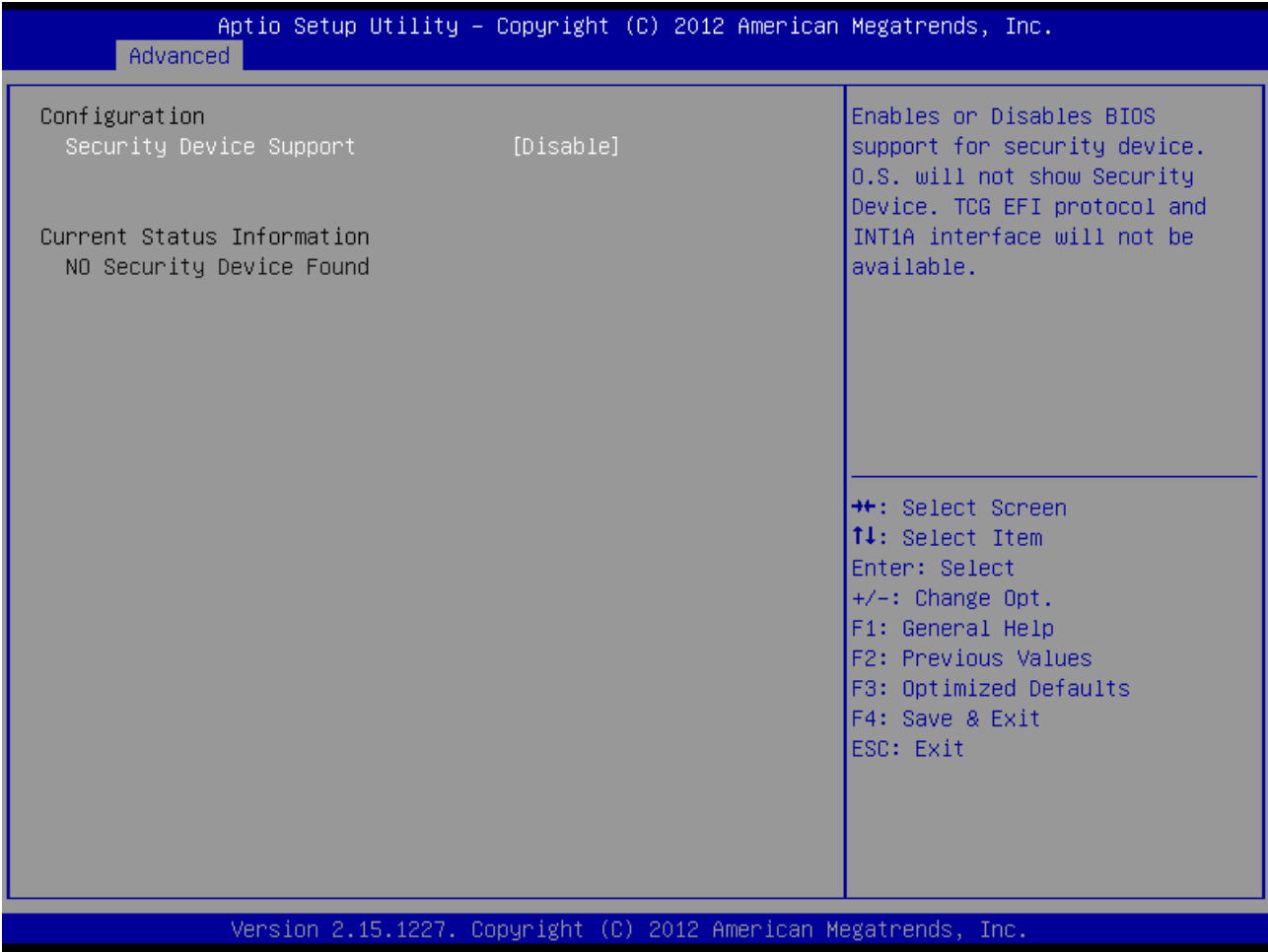
3.5.2.3 S5 RTC Wake Settings

Use the S5 RTC Wake Settings menu to enable or disable the system to wake up on a specified time.



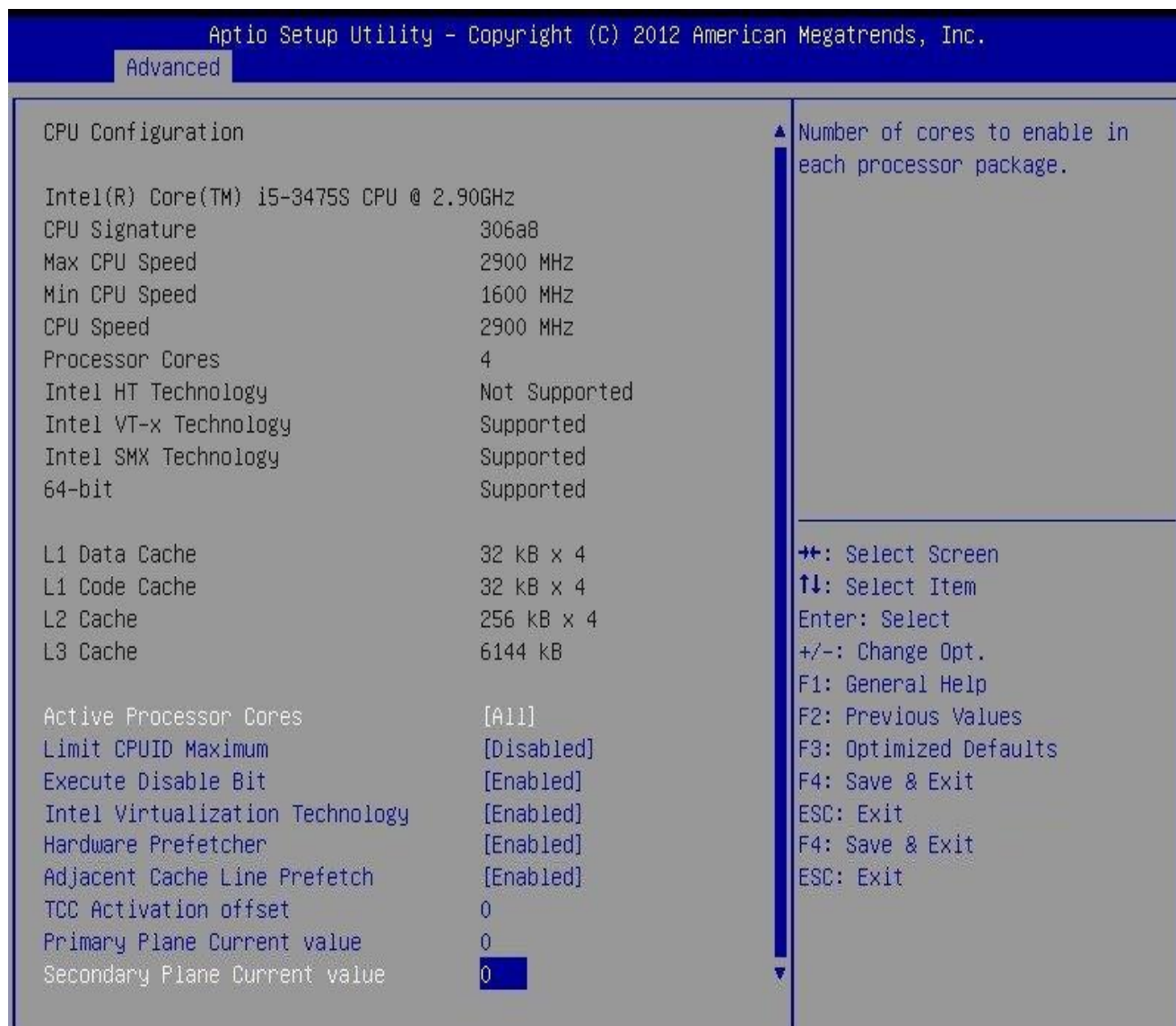
3.5.2.4 Trusted Computing

Use the Trusted Computing menu to view the current TCP status and enable or disable the system to support security devices. When the Security Device Support field is set to [Disabled], the operating system will not show security devices.



3.5.2.5 CPU Configuration

Use the CPU Configuration menu to view detailed CPU specification and configure the CPU.

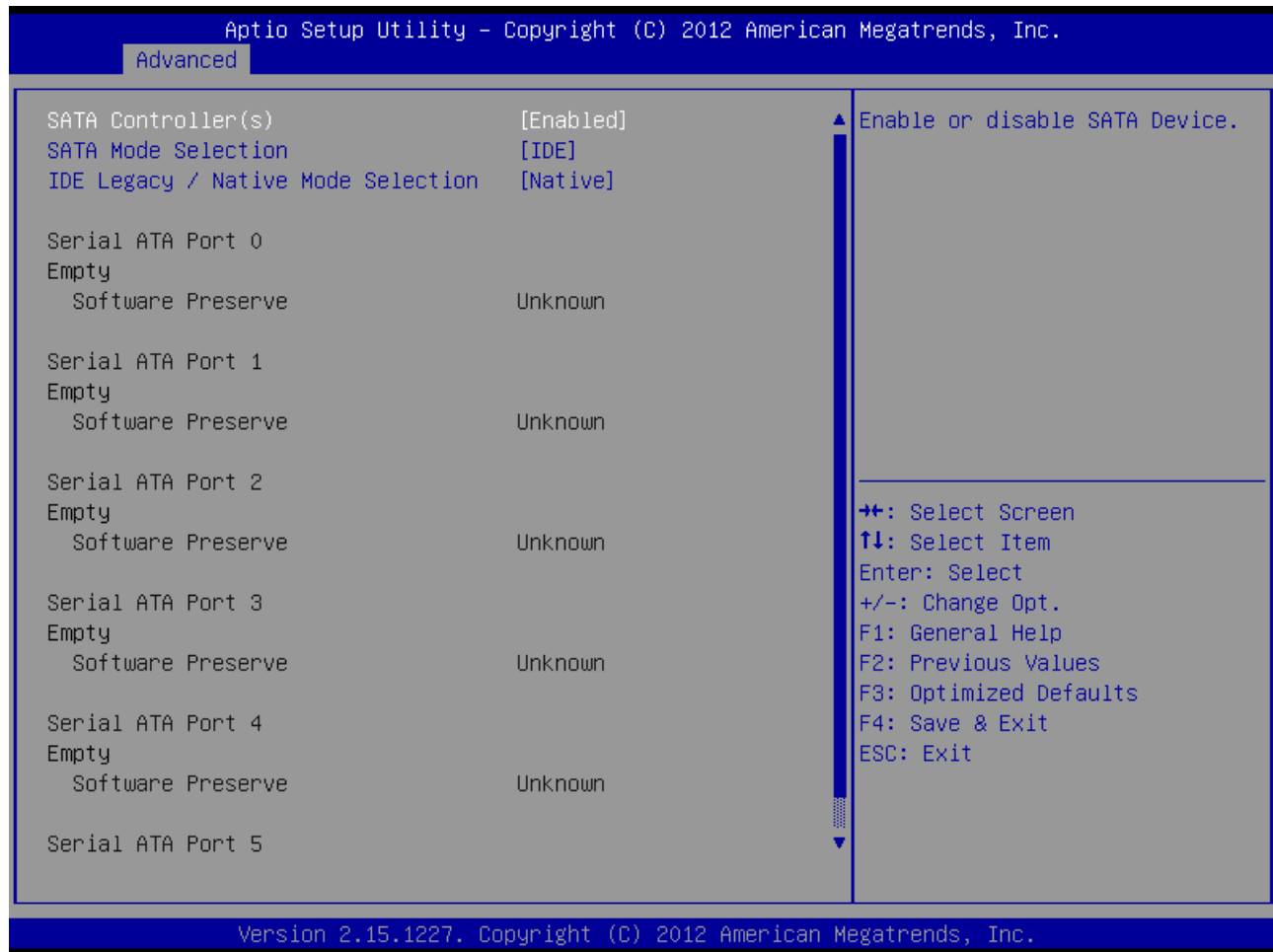


Item	Description
Hyper-threading	Enables or disables Intel® Hyper Threading technology, which improves parallelization of computations.
Active Processor Cores	Sets the active processor cores.
Limit CPUID Maximum	Enables or disables limitation of maximum CPUID.
Execute Disable Bit	Enables or disables execution of disabled bit.
Intel Virtualization Technology	Enables or disables Intel® Virtualization Technology, which utilizes the additional hardware capabilities.
Hardware Prefetcher	Enables or disables hardware prefetching.
Adjacent Cache Line Prefetch	Enables or disables prefetching of adjacent cache lines.
TCC Activation Offset	Sets the TCC activation offset value.

Primary Plane Current Value	Sets the maximum instantaneous current allowed for the primary plane.
Secondary Plane Current Value	Sets the maximum instantaneous current allowed for the secondary plane.

3.5.2.6 SATA Configuration

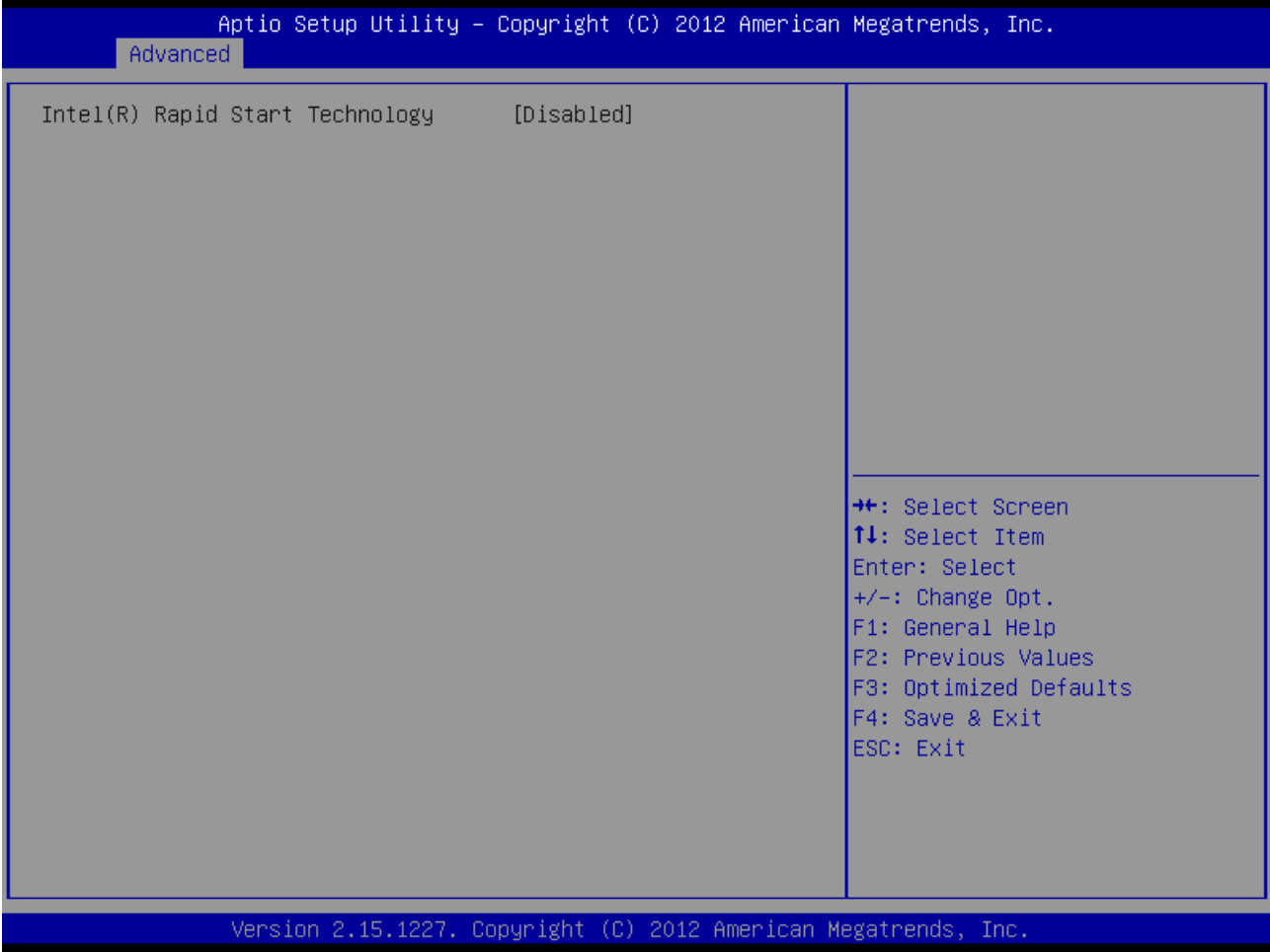
Use the SATA Configuration menu to view and configure SATA devices.



Item	Description
SATA Controller(s)	Enables or disables Serial ATA controller.
SATA Mode Selection	Sets the SATA mode.
IDE Legacy / Native Mode Selection	Sets the IDE mode to Legacy or Native.

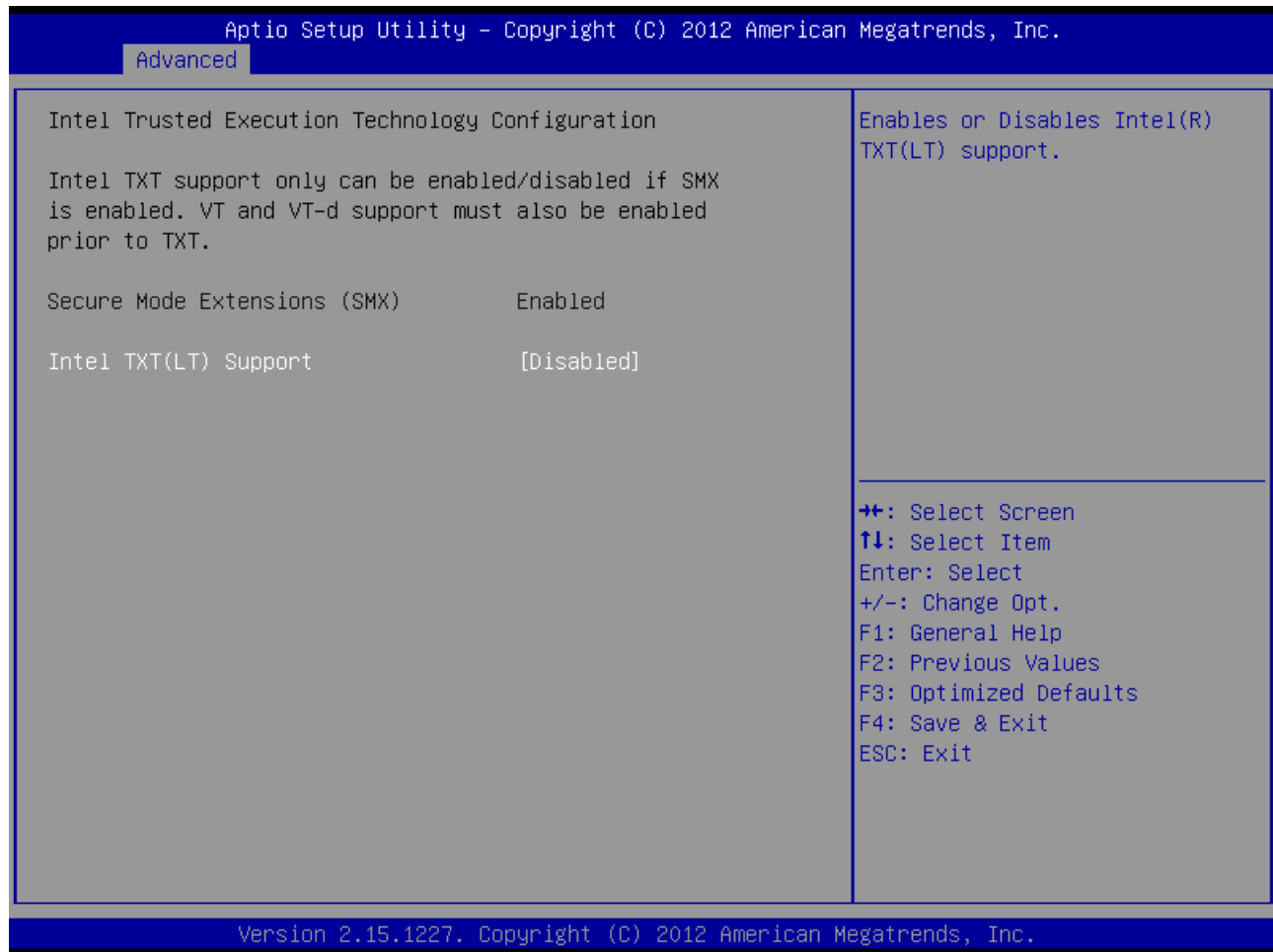
3.5.2.7 Intel® Rapid Start Technology

Use the Intel® Rapid Start Technology menu to enable or disable this feature. The Intel® Rapid Start Technology enables the system to get up and run faster from the deepest sleep, saving time and power consumption.



3.5.2.8 Intel® Trusted Execution Technology Configuration

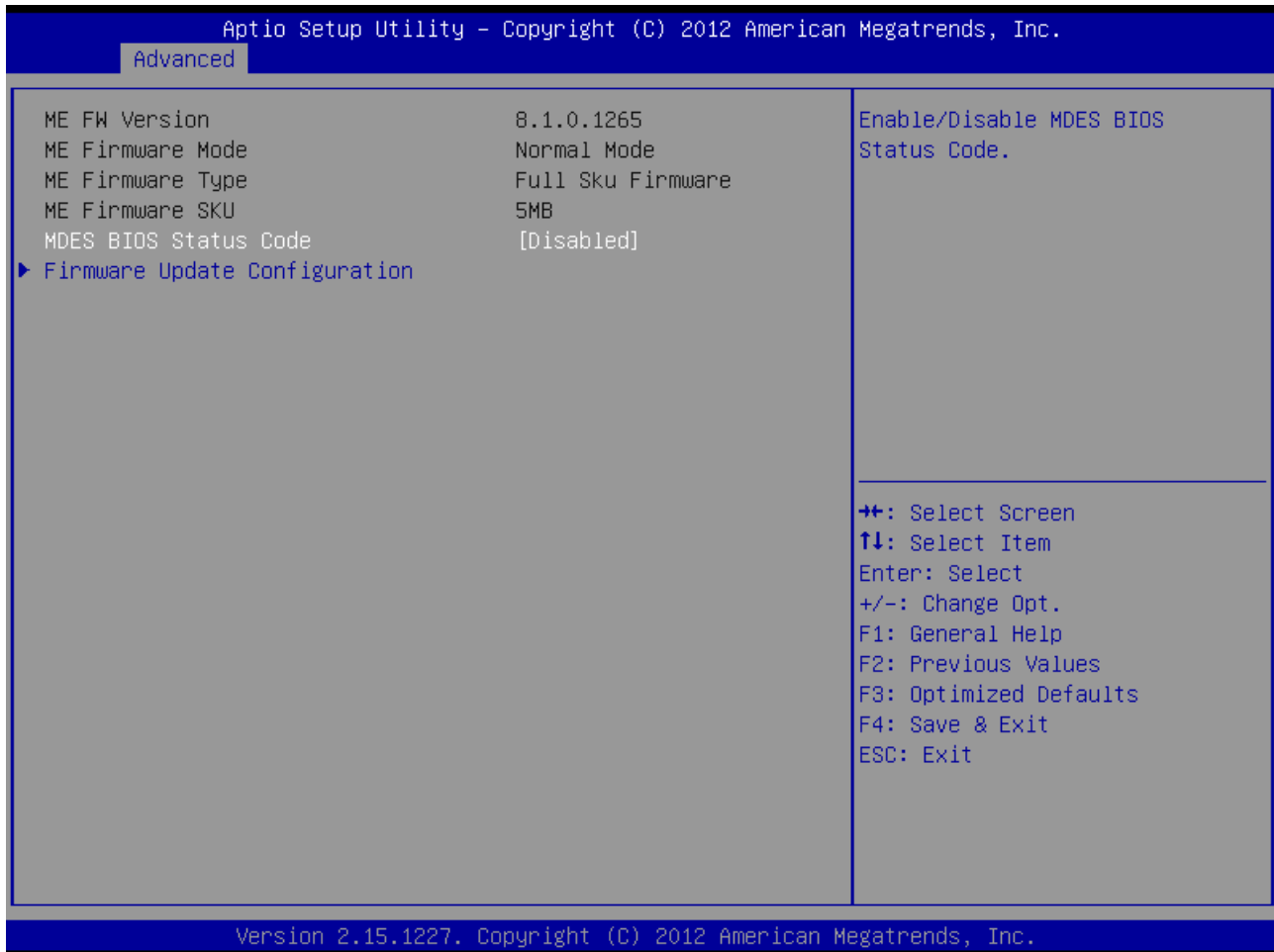
Use the Intel® TXT (LT) Configuration menu to enable or disable support of this feature.



Item	Description
Secure Mode Extensions (SMX)	Enables or disables secure mode extensions.
Intel TXT(LT) Support	Enables or disables Intel® TXT(LT) support.

3.5.2.9 PCH-FW Configuration

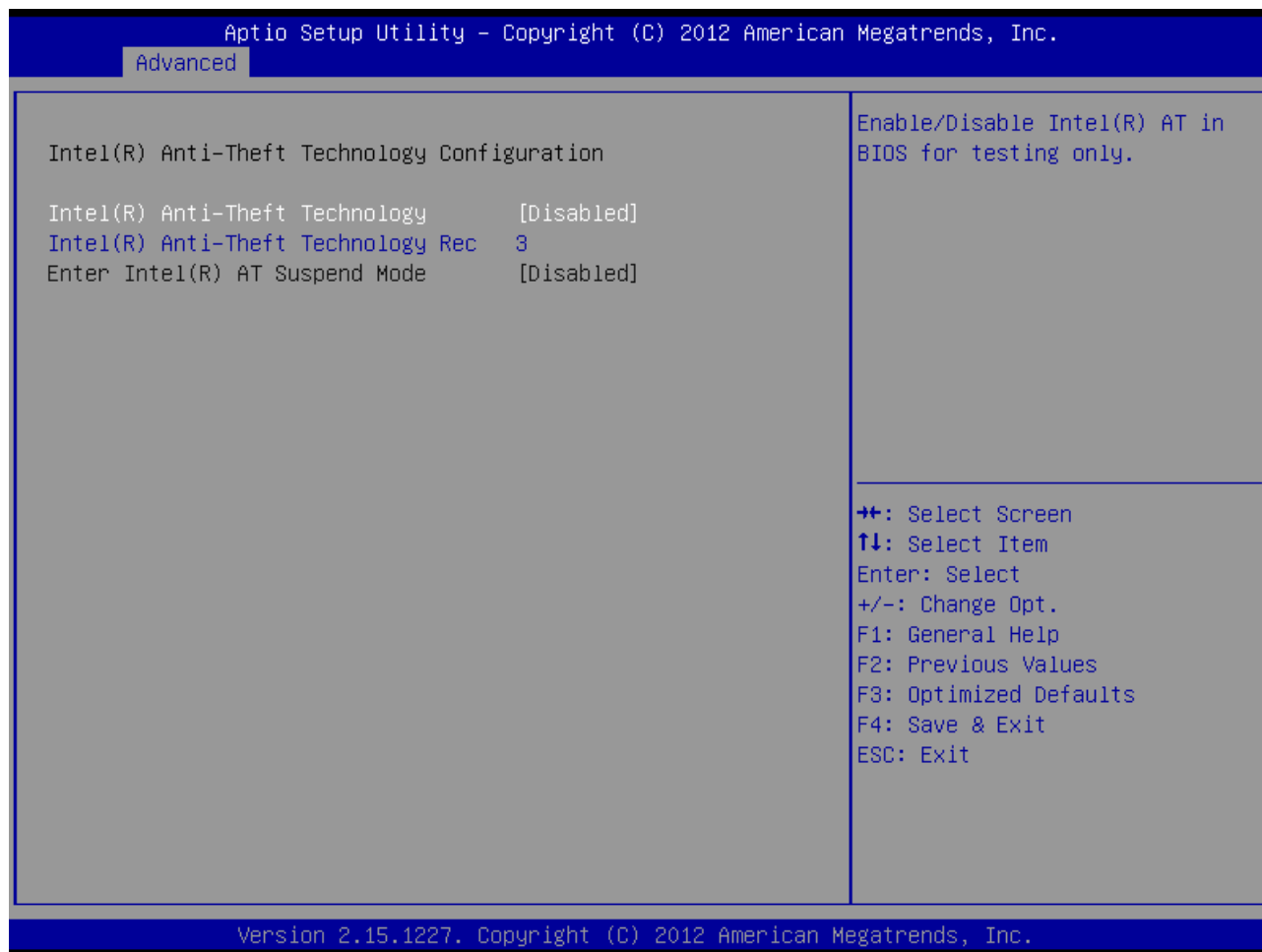
Use the PCH-FW Configuration menu to view the firmware version, mode, type and other information, as well as configure MDES BIOS Status Code and re-flash ME firmware image.



Item	Description
MDES BIOS Status Code	Enables or disables MDES BIOS status code.
Firmware Update Configuration	Enables or disables firmware ME firmware image re-flash function.

3.5.2.10 Intel® Anti-Theft Technology Configuration

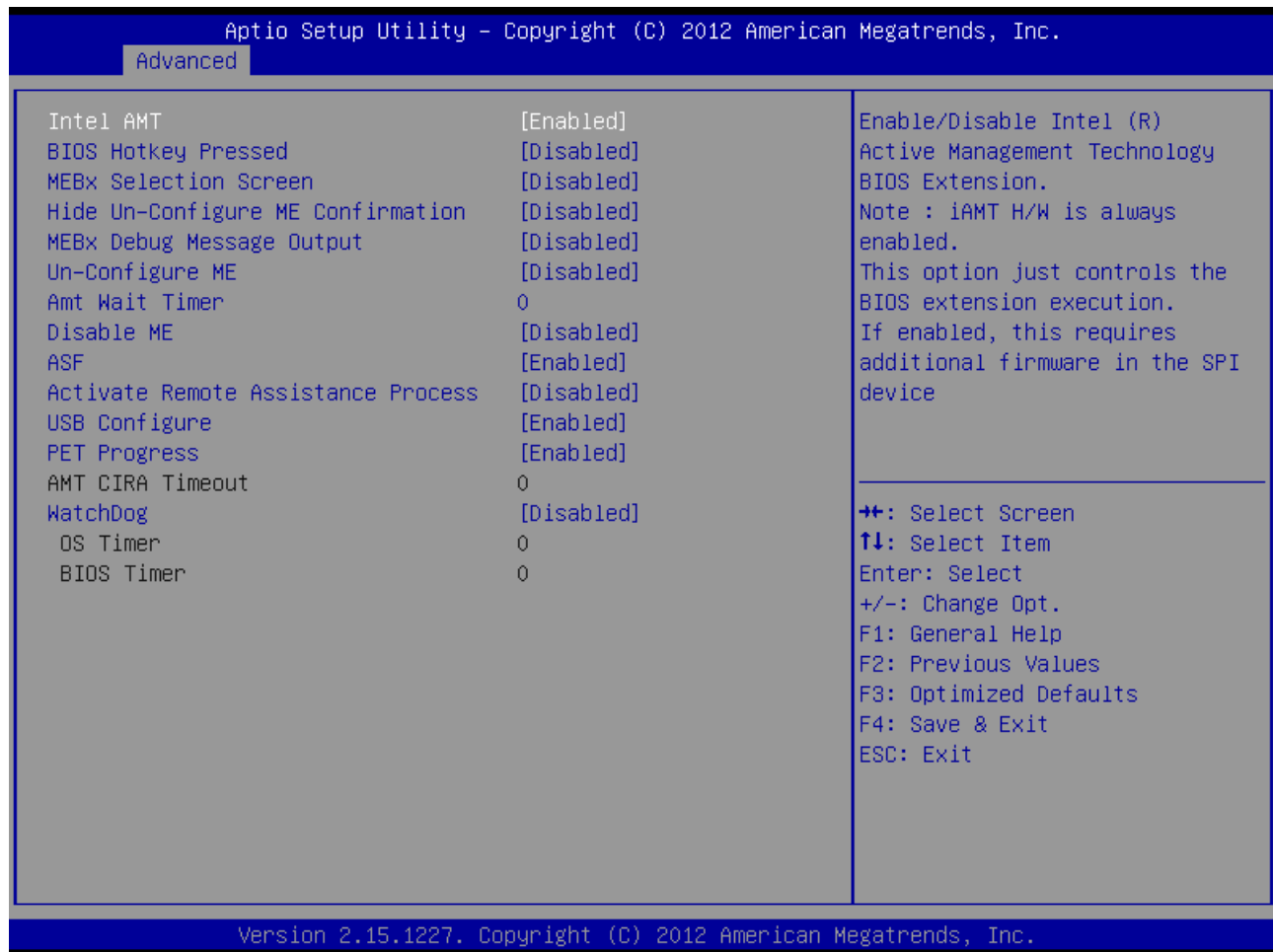
Use the Intel® Anti-Theft Technology Configuration menu to enable or disable this feature in BIOS. However, this feature is available for testing only.



Item	Description
Intel® Anti-Theft Technology	Enables or disables Intel® Anti-Theft Technology.
Intel® Anti-Theft Technology Rec	Sets the number of Intel® Anti-Theft Technology record.
Enter Intel® AT Suspend Mode	Enables or disables the system to enter suspend mode when theft is detected.

3.5.2.11 Intel® Active Management Technology Configuration

Use the AMT Configuration menu to configure the BIOS extension execution of Intel® Active Management Technology.

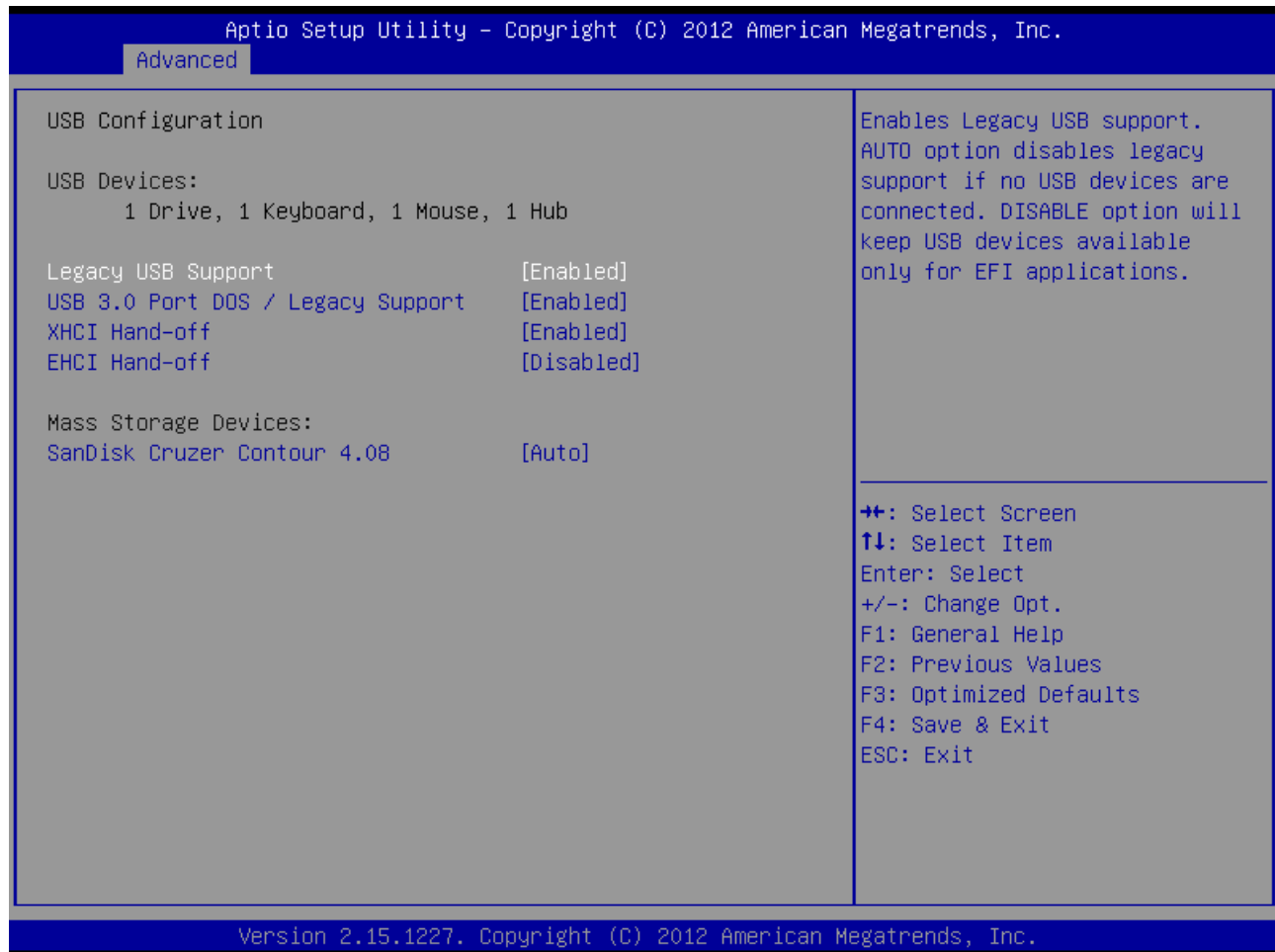


Item	Description
Intel® AMT	This option controls the BIOS extension execution. When enabled, this requires additional firmware in the SPI device.
BIOS Hotkey Pressed	Enables or disables pressing of BIOS hotkey.
MEBx Selection Screen	Enables or disables MEBx Selection Screen.
Hide Un-Configure ME Confirmation	Enables or disables hiding of un-configured ME confirmation,
Un-Configure ME	Enables or disables un-configure ME.
Amt Wait Timer	Sets the wait timer for AMT.
Disable ME	Enables or disables disable ME.
ASF	Enables or disables ASF.
Activate Remote Assistance Process	Enables or disables Remote Assistance Process.
USB Configure	Enables or disables USB configuration.

Item	Description
PET Progress	Enables or disables PET Progress.
AMT CIRA Timeout	Sets AMT CIRA Timeout.
WatchDog	Enables or disables WatchDog.
OS Timer	Sets the OS timer.
BIOS Timer	Sets the BIOS timer.

3.5.2.12 USB Configuration

Use the USB Configuration menu to configure legacy USB devices.



Item	Description
Legacy USB Support	Enables or disables legacy USB support.
USB 3.0 Port DOS / Legacy Support	Enables or disables DOS or legacy support of USB 3.0 devices.
XHCI Hand-off	Enables or disables XHCI Hand-off.
EHCI Hand-off	Enables or disables EHCI Hand-off.
Mass Storage Devices	Setting to [Auto] disables legacy support if no USB device is connected.

3.5.2.13 F81214 Super I/O Configuration (COM1/COM2)

Use the F81214 Super I/O Configuration (COM1/COM2) menu to configure serial ports 1 and 2.



Select the Serial Port number to configure, and then press the <Enter> key.
The Serial Port [number] Configuration screen appears.

Serial Port 1 Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	
		** : Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC : Exit
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Item	Description
Serial Port	Enables or disables the serial port.
Device Settings	Displays the device settings.

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Serial Port 2 Configuration

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Advanced

Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F8h; IRQ=4;	

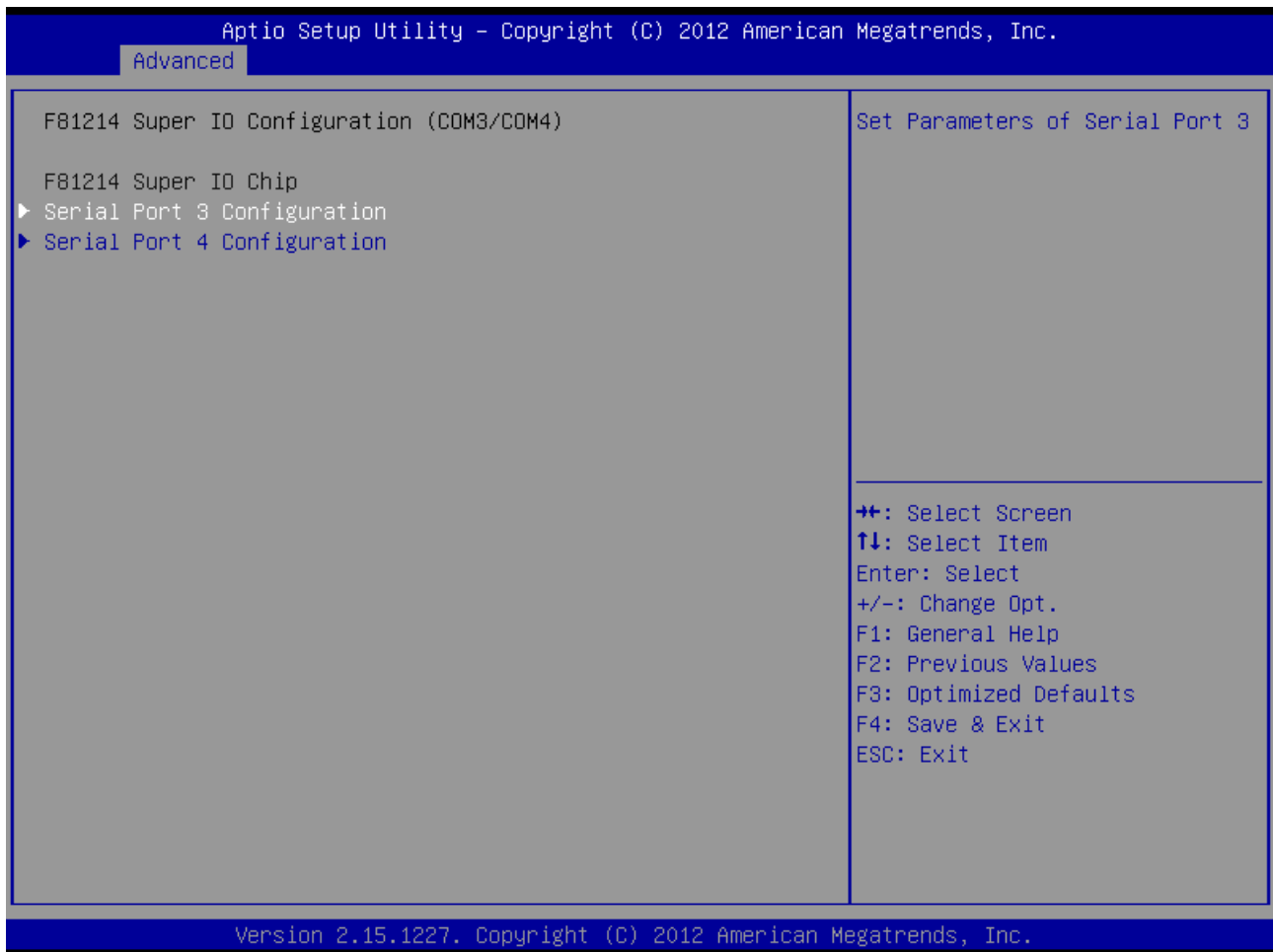
++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Item	Description
Serial Port	Enables or disables the serial port.
Device Settings	Displays the device settings.

3.5.2.14 F81214 Super I/O Configuration (COM3/COM4)

Use the F81214 Super I/O Configuration (COM3/COM4) menu to configure serial ports 3 and 4.



Select the Serial Port number to configure, and then press the <Enter> key.
The Serial Port [number] Configuration screen appears.

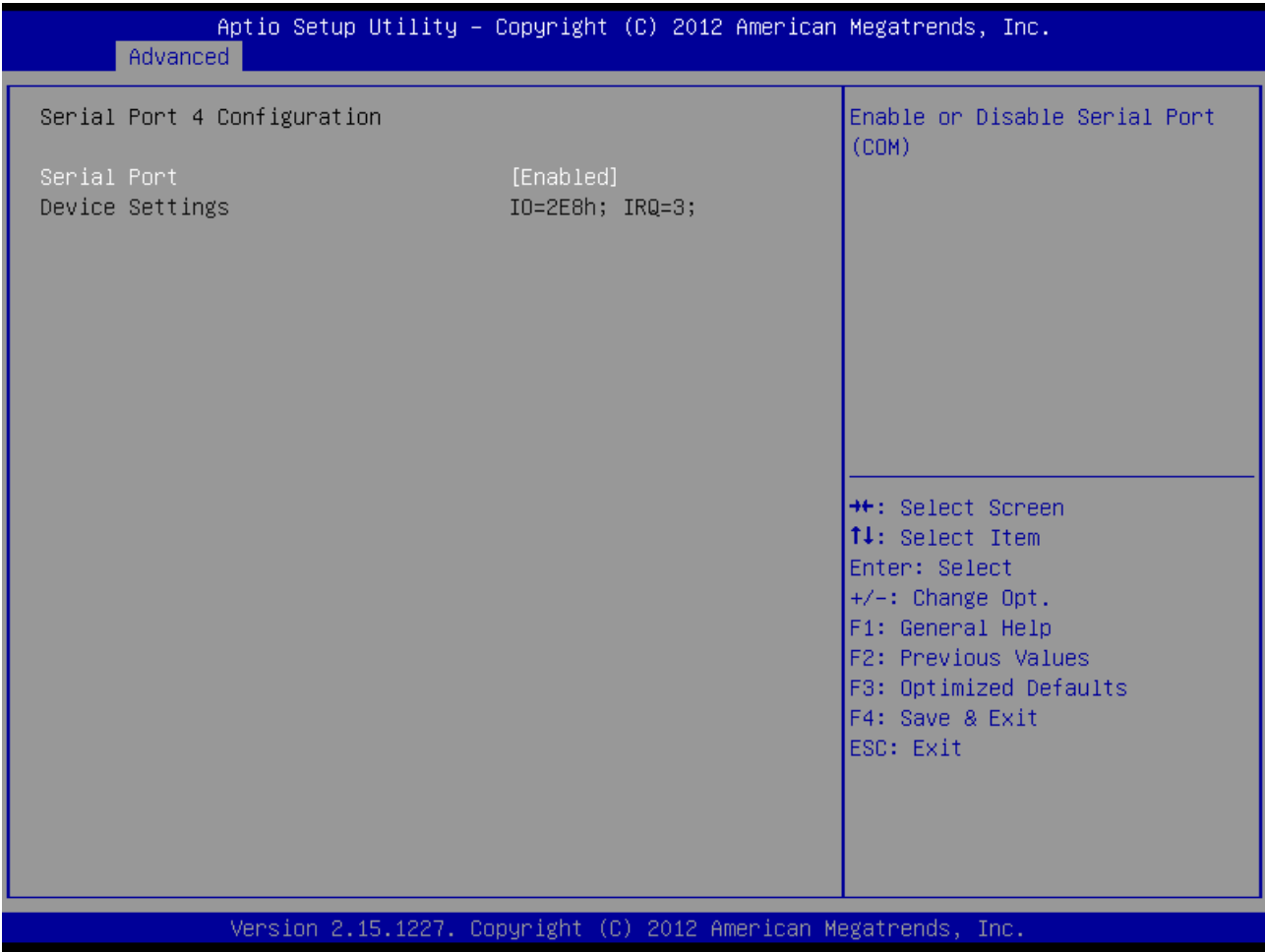
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Serial Port 3 Configuration



Item	Description
Serial Port	Enables or disables the serial port.
Device Settings	Displays the device settings.

Serial Port 4 Configuration



Item	Description
Serial Port	Enables or disables the serial port.
Device Settings	Displays the device settings.

3.5.2.15 ITE8728 Super I/O Configuration

Use the ITE8728 Super I/O Configuration menu to configure serial ports 5 and 6 and the parallel port.



Select the port to configure, and then press the <Enter> key.

If one of the serial ports is selected, the Serial Port [number] Configuration screen appears.

If Parallel Port Configuration is selected, the Parallel Port Configuration screen appears.

Serial Port 5 Configuration



Item	Description
Serial Port	Enables or disables the serial port.
Device Settings	Displays the device settings.

Serial Port 6 Configuration



Item	Description
Serial Port	Enables or disables the serial port.
Device Settings	Displays the device settings.

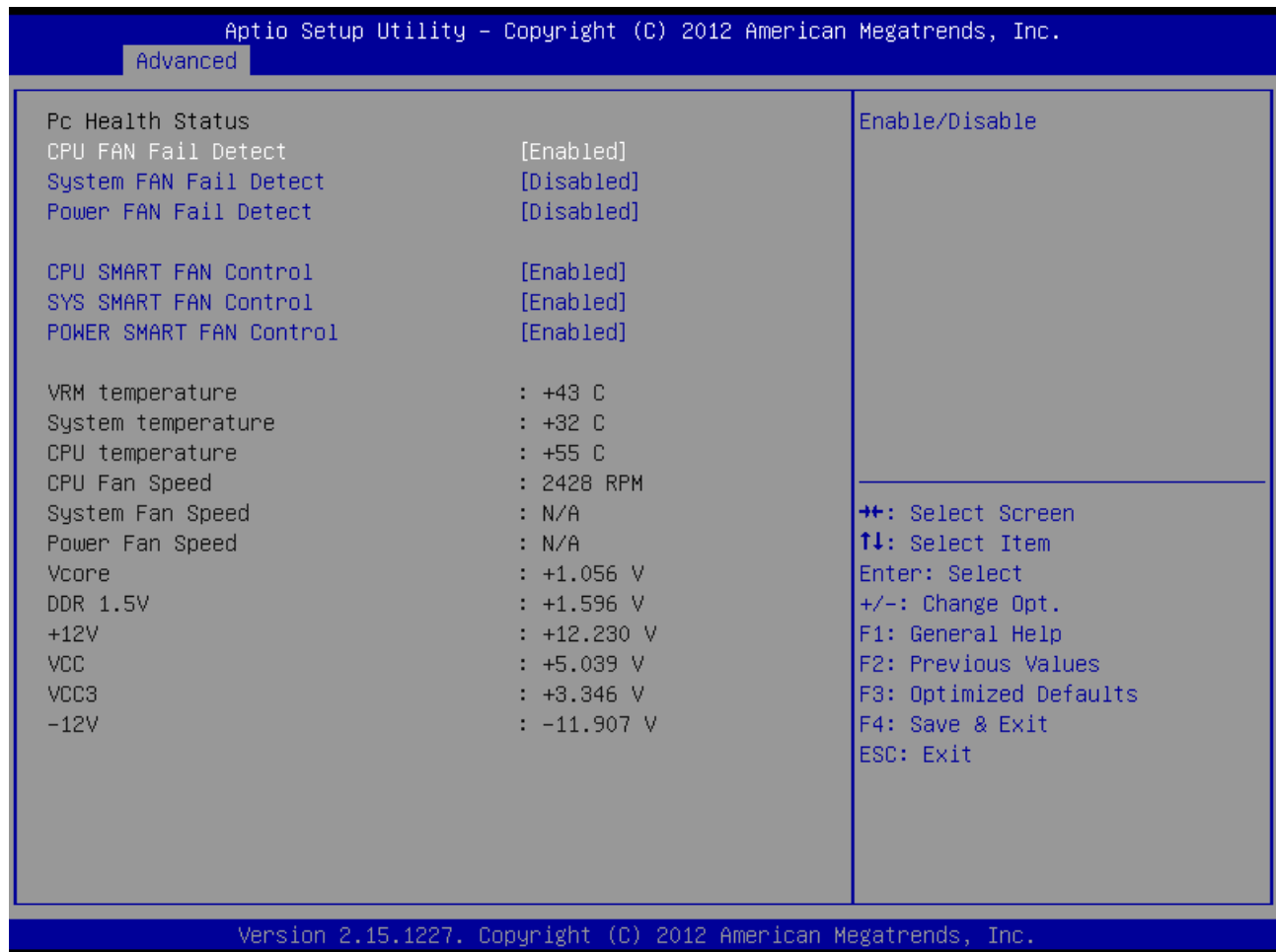
Parallel Port Configuration

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
Parallel Port Configuration		Enable or Disable Parallel Port (LPT/LPTE)
Parallel Port	[Enabled]	
Device Settings	IO=378h; IRQ=6;	
Device Mode	[Standard Parallel P...]	
		** : Select Screen ↑↓ : Select Item Enter : Select +/- : Change Opt. F1 : General Help F2 : Previous Values F3 : Optimized Defaults F4 : Save & Exit ESC : Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.		

Item	Description
Parallel Port	Enables or disables the parallel port.
Device Settings	Displays the device settings.
Device Mode	Sets the parallel port mode.

3.5.2.16 Hardware Monitor

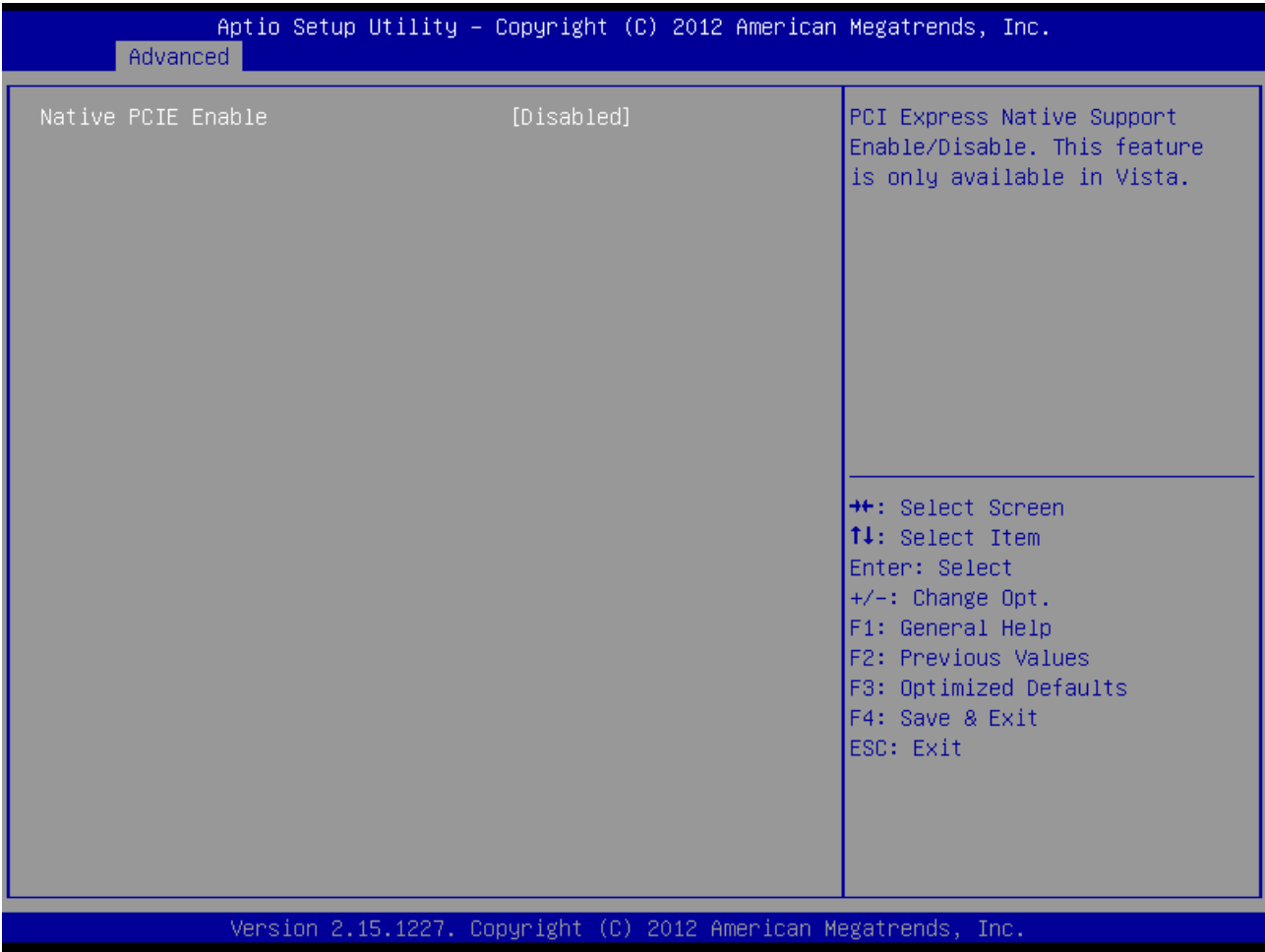
Use the H/W Monitor menu to view the system temperature, CPU speed and others, as well as configure fan controls and fail detection.



Item	Description
CPU FAN Fail Detect	Enables or disables CPU fan fail detection.
System FAN Fail Detect	Enables or disables system fan fail detection.
Power FAN Fail Detect	Enables or disables power fan fail detection.
CPU SMART FAN Control	Enables or disables CPU smart fan control.
SYS SMART FAN Control	Enables or disables system smart fan control.
POWER SMART FAN Control	Enables or disables power smart fan control.

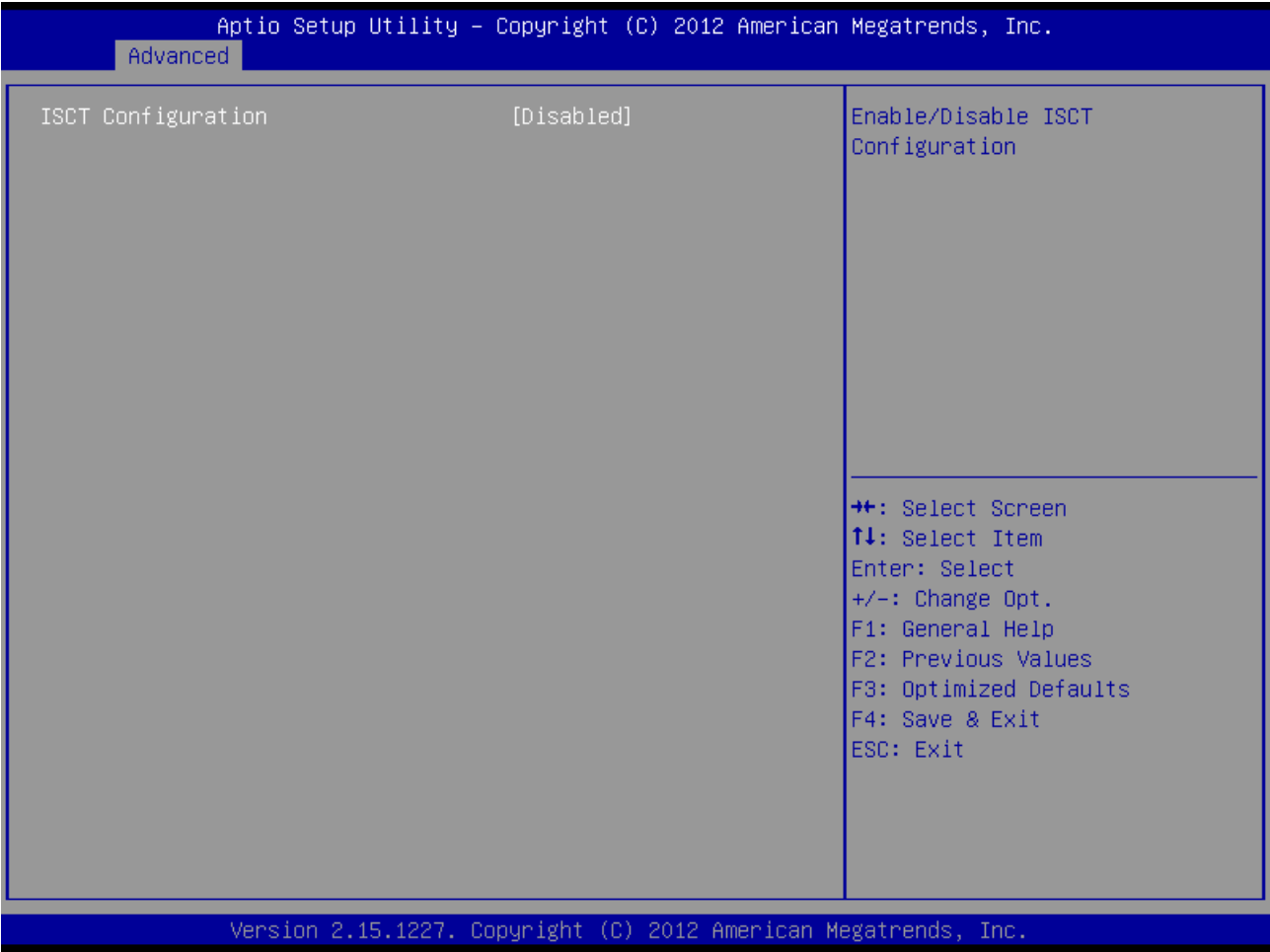
3.5.2.17 Platform Miscellaneous Configuration

Use the Platform Miscellaneous Configuration menu to enable or disable PCI Express Native support. This option is available only in Windows® Vista OS.



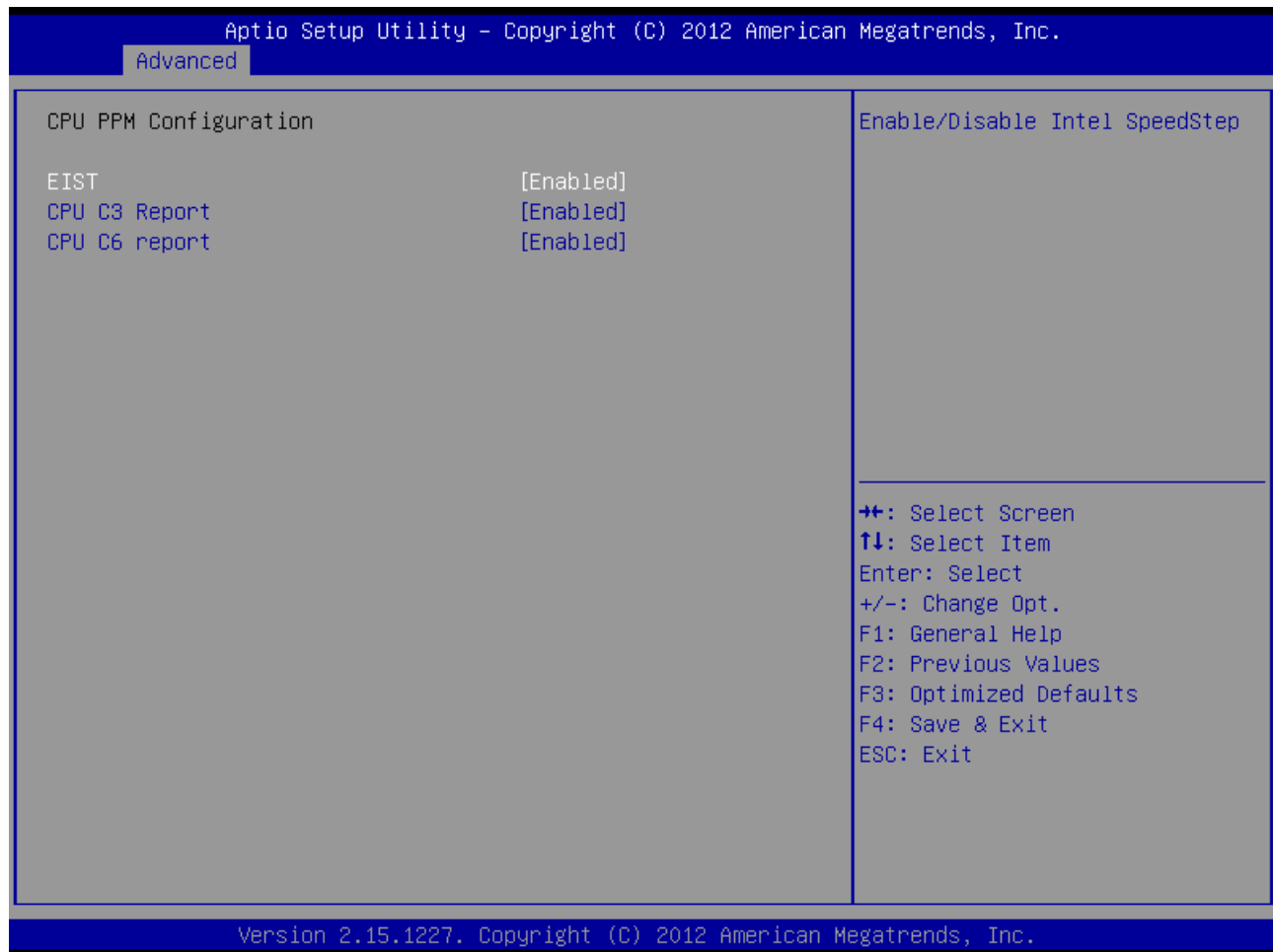
3.5.2.18 Intel® Smart Connect Technology

Use the Intel® Smart Connect Technology menu to enable or disable this feature.



3.5.2.19 CPU PPM Configuration

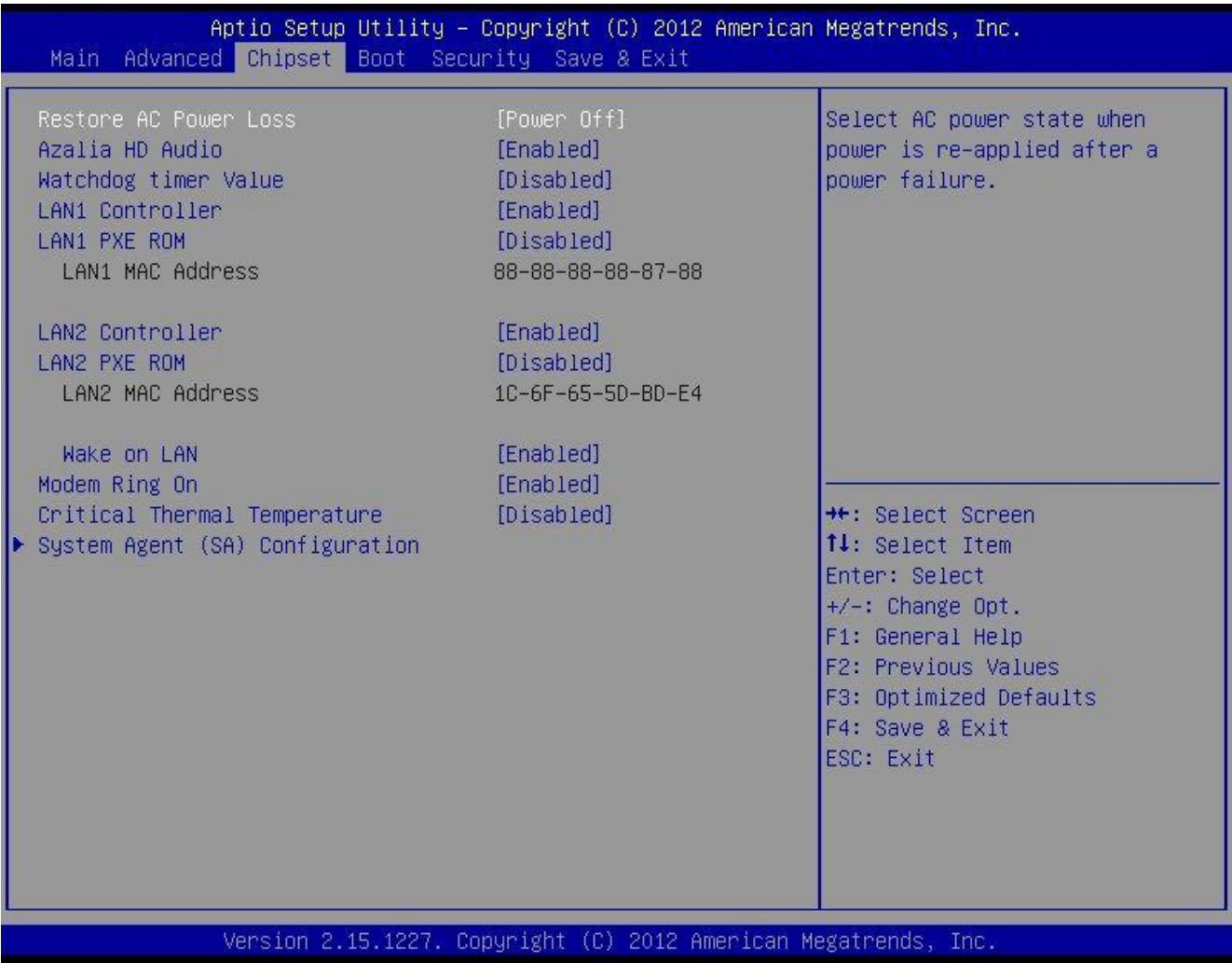
Use the CPU PPM Configuration menu to configure the Processor Power Management (PPM).



Item	Description
EIST	Enables or disables Intel® SpeedStep. The Intel® SpeedStep feature allows the system to dynamically adjust the processor voltage and core frequency, which can decrease average power consumption and heat production.
CPU C3 Report	Enables or disables CPU C3 report.
CPU C6 Report	Enables or disables CPU C6 report.

3.5.3 Chipset Settings

This section allows you to configure the chipset settings.

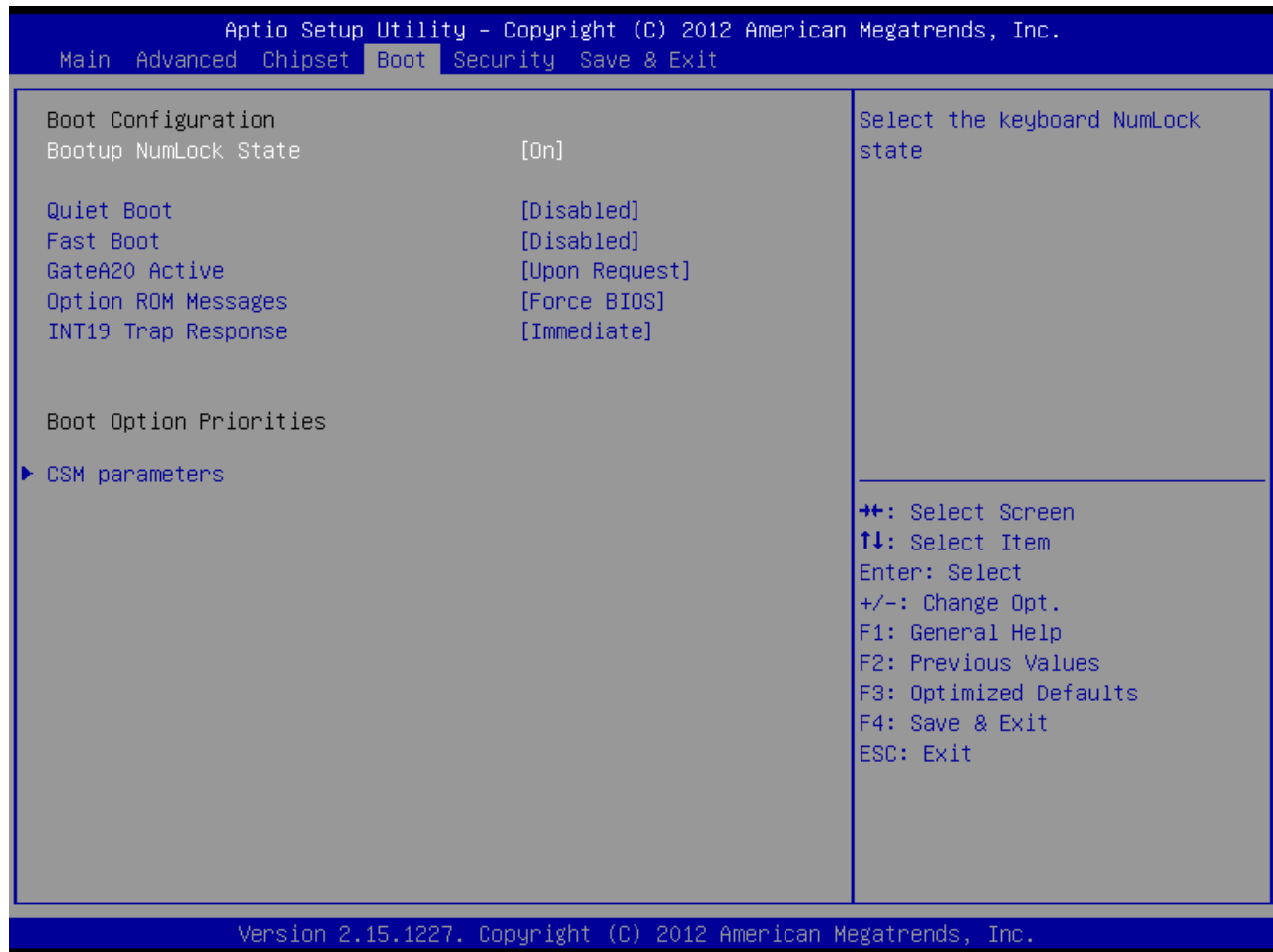




Item	Description
Restore AC Power Loss	Sets the AC power state when power is re-applied after a power failure.
Azalia HD Audio	Enables or disables Azalia HD audio.
Watchdog timer value	Enables or disables the watchdog timer value.
LAN1 Controller	Enables or disables LAN1 controller.
LAN1 PXE ROM	Enables or disables LAN1 PXE ROM.
LAN2 Controller	Enables or disables LAN2 controller.
LAN2 PXE ROM	Enables or disables LAN2 PXE ROM.
Wake on LAN	Enables or disables the system to wake on via LAN.
Modem Ring On	Enables or disables modem to ring.
System Agent Configuration	Enables or disables the VT-d function on MCH.

3.5.4 Boot Settings

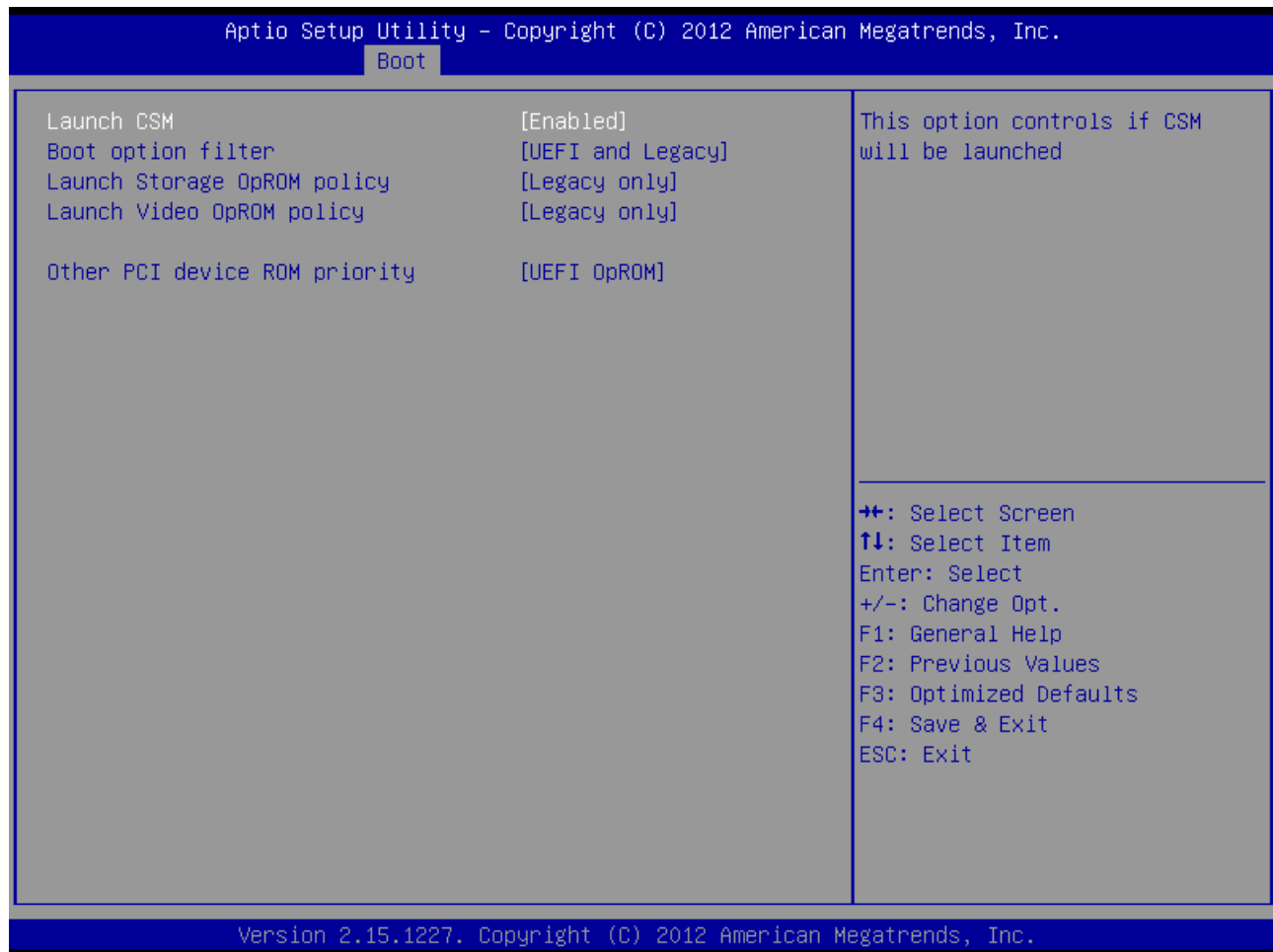
This section allows you to configure the boot settings.



Item	Description
Bootup NumLock State	Sets the keyboard NumLock state during boot up.
Quiet Boot	Enables or disables quiet boot.
Fast Boot	Enables or disables fast boot.
GateA20 Active	Sets the GateA20 mode.
Option ROM Messages	Sets the option for ROM messages.
INT19 Trap Response	Sets the INT19 trap response action time.
CSM parameters	Sets the Compatibility Support Module (CSM) options. See below.

3.5.4.1 CSM Parameters

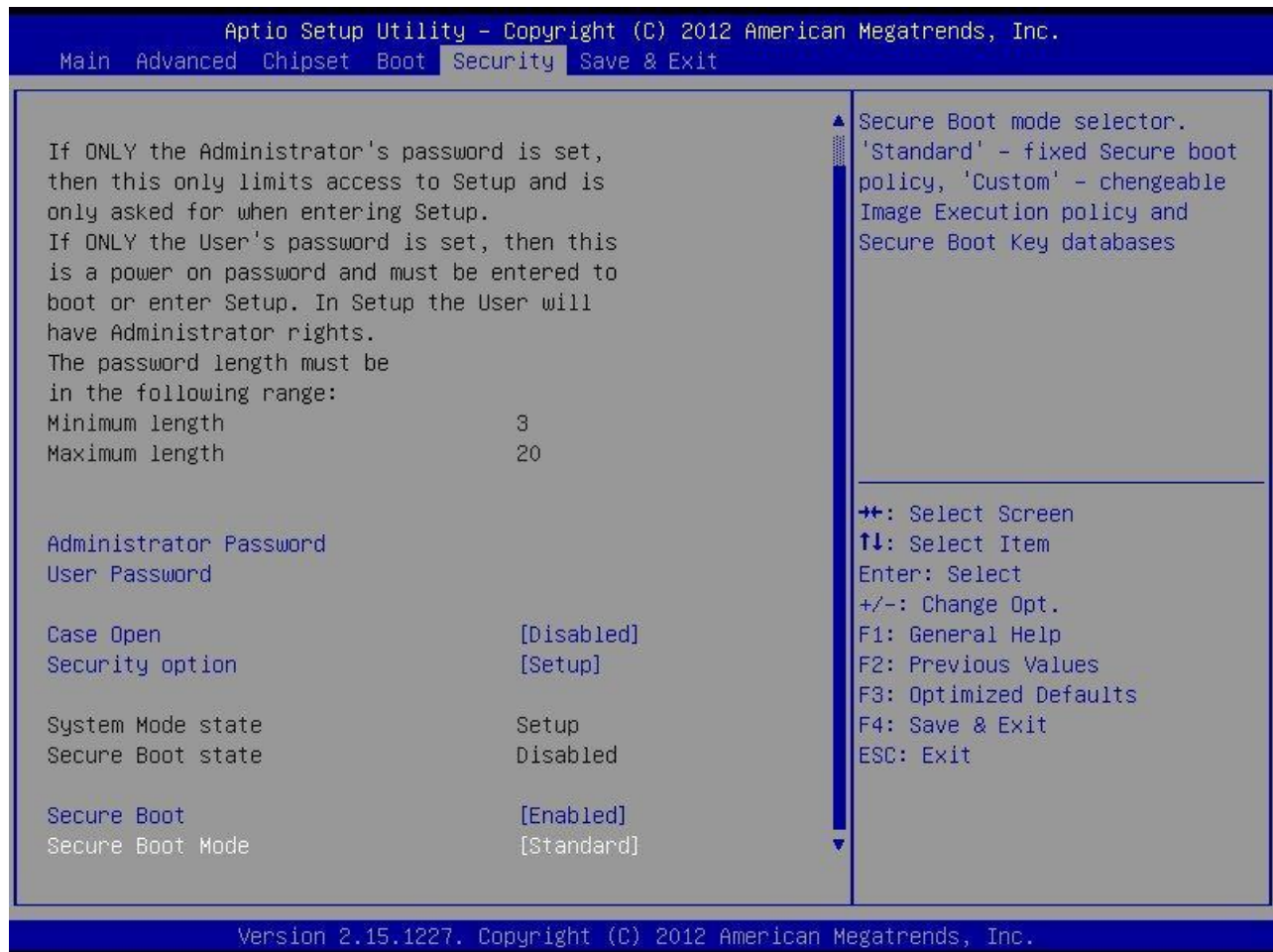
Use the CSM Parameters menu to configure options for Compatibility Support Module (CSM).

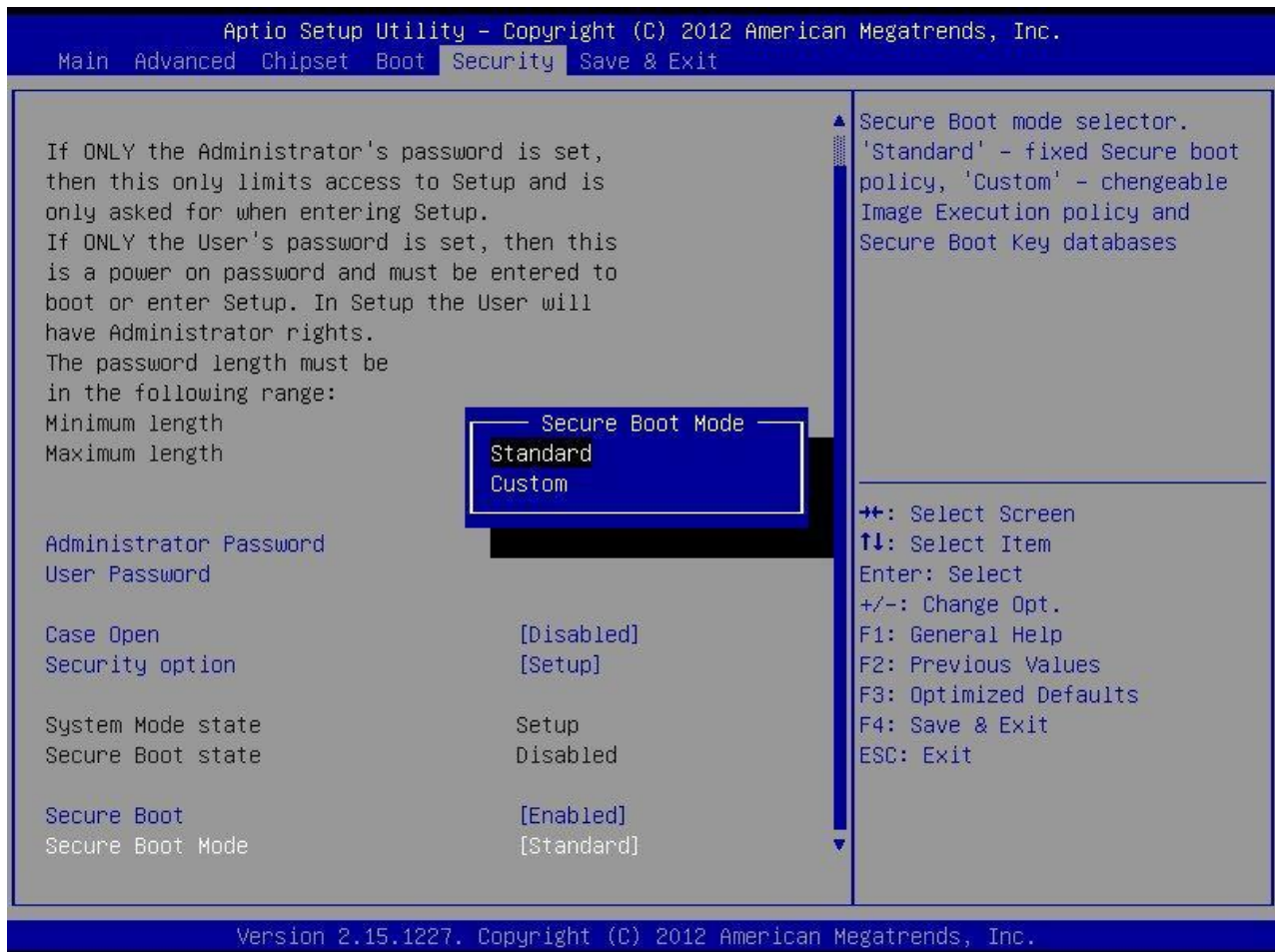


Item	Description
Launch CSM	Enables or disables launching of CSM.
Boot option filter	Sets the CSM boot option filter.
Launch Storage OpROM policy	Sets the storage OpROM policy when launching CSM.
Launch Video OpROM policy	Sets the video OpROM policy when launching CSM.
Other PCI device ROM priority	Sets other PCI device ROM priority.

3.5.5 Security Settings

This section allows you to configure the security settings, such as passwords and secure boot.

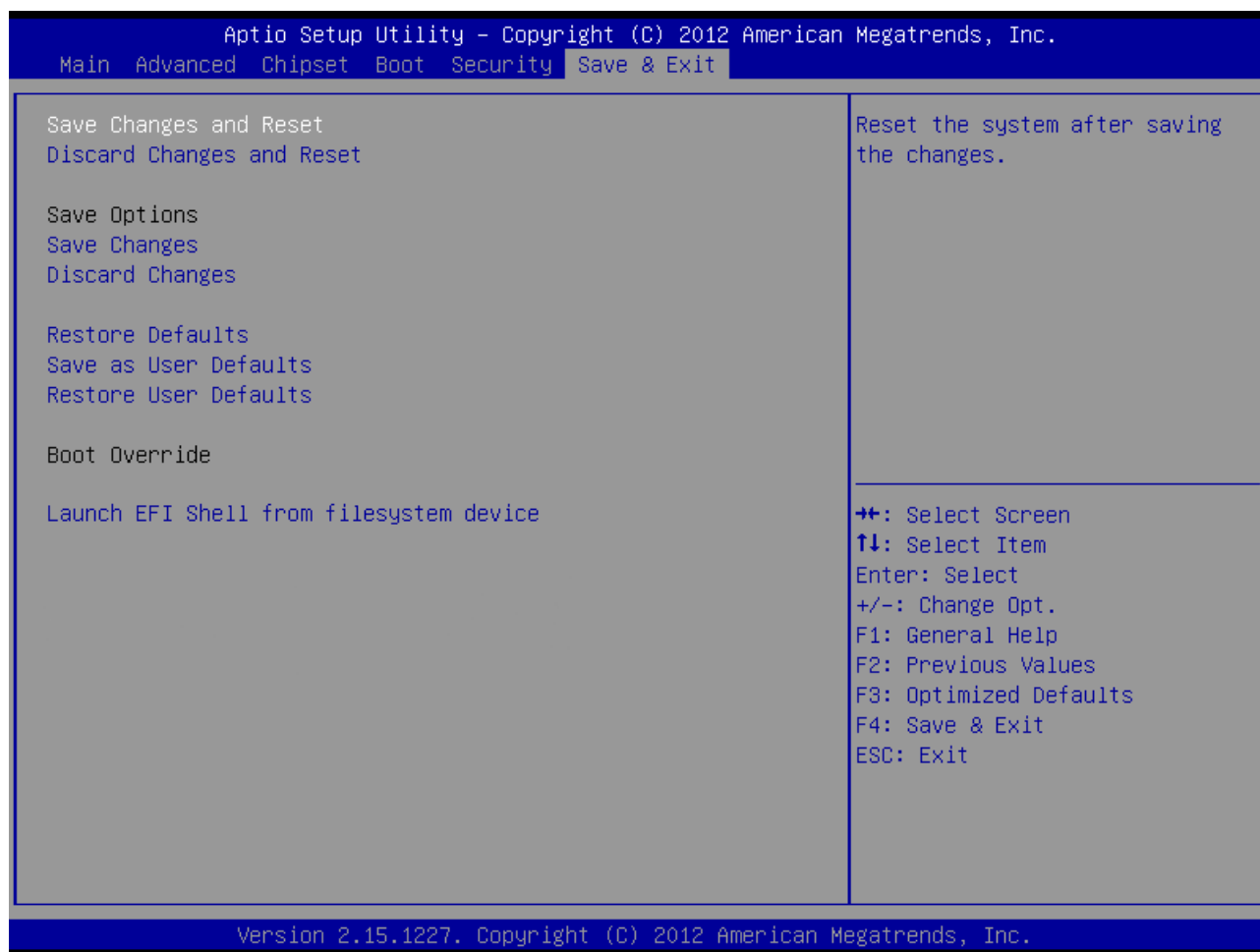




Item	Description
Administrator Password	Sets the administrator password.
User Password	Sets the user password.
Case Open	Enables or disables opening of case detection.
Security option	Sets the security option.
Secure Boot	Enables or disables secure boot.

3.5.6 Save and Exit Settings

This section allows you to save changes and close the BIOS setup menu or restore the factory default settings.



Item	Description
Save Changes and Reset	Saves the modified settings and then resets the system.
Discard Changes and Reset	Discards any modifications and then resets the system.
Save Options	Saves the options.
Save Changes	Saves the modifications.
Discard Changes	Discards the modifications and restores the current settings.
Restore Defaults	Restores the factory default settings.
Save as User Defaults	Saves the current settings as user default settings.
Restore User Defaults	Restores the user default settings.
Launch EFI Shell from filesystem device	Launches EFI shell from the file system device (such as a USB storage).